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PC Computing

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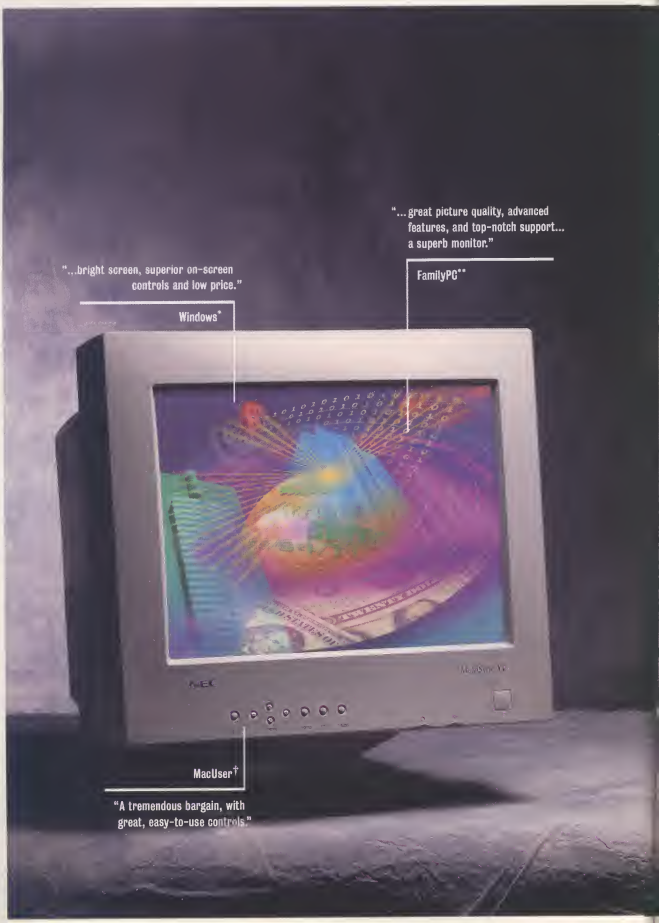
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Plug and Play Compatibility

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OptiClear Screen Surface
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PCMCIA Slots	2 Type II	2 Type II	2 Type II	2 Type II
16-Bit Audio	No	No	Yes	Yes
Internal CD-ROM Drive	N/A	N/A	Optional	Optional
Pointing Device	Optical Trackball	Optical Trackball	EasyPoint™ II	EasyPoint II
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Software	MS-Windows® 95 or MS-Windows 3.1	MS-Windows 95 or MS-Windows 3.1	MS-Windows 95 or MS-Windows 3.1; MS-Video for Windows, Compaq Sound System	MS-Windows 95 or MS-Windows 3.1; MS-Video for Windows, Compaq Sound System
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Networks for the '90s

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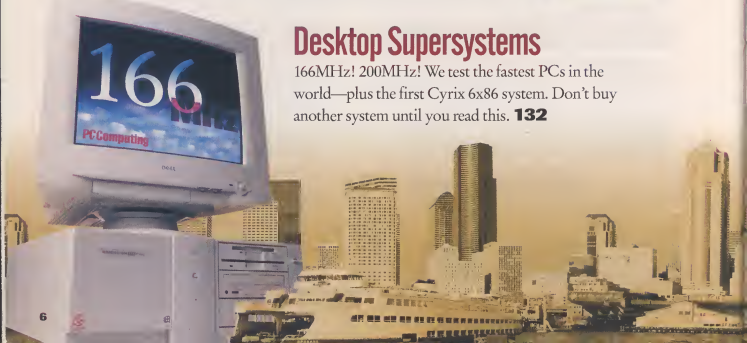

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Home-Office Steals The best color notebooks for around two grand, printing your own photos for pennies, and a dirt-cheap digital modem! Plus, 3-D hi-fis, all-in-one office-software toolkits, and wireless pointers. **281**

I-Way

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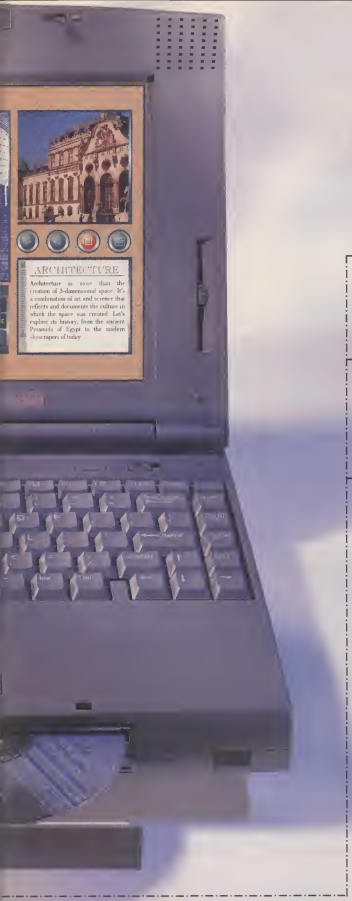

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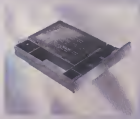

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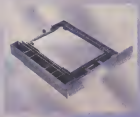

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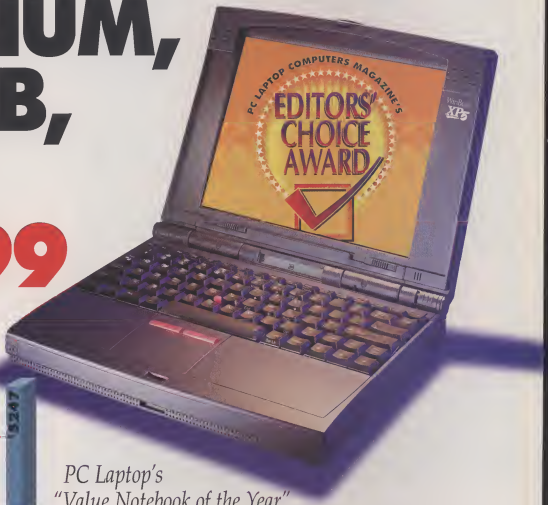

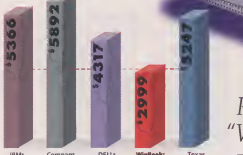

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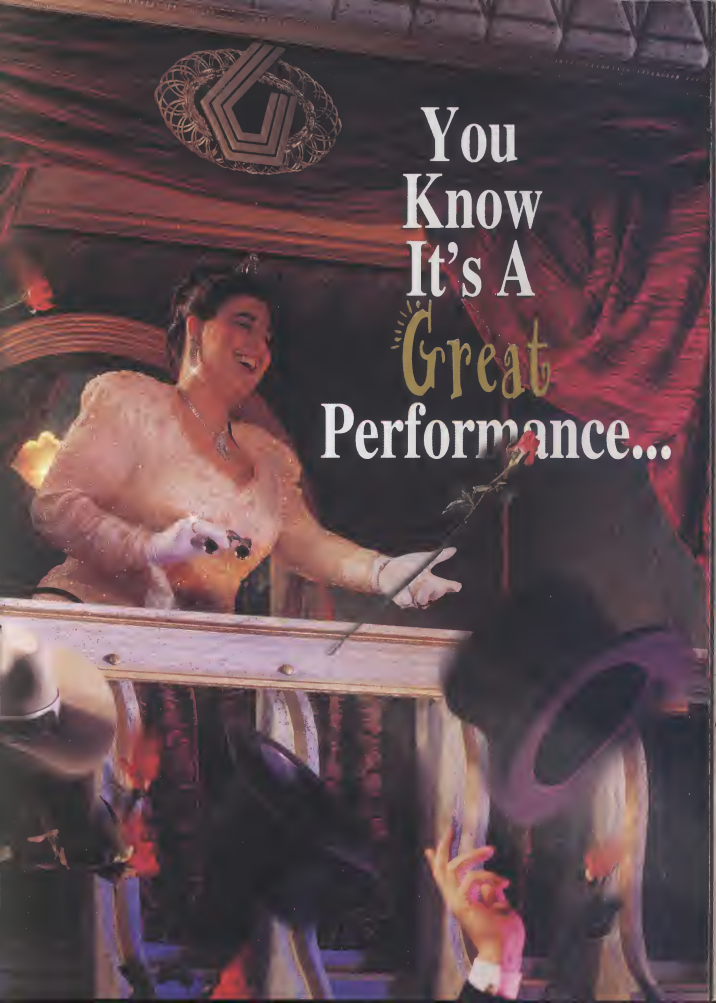
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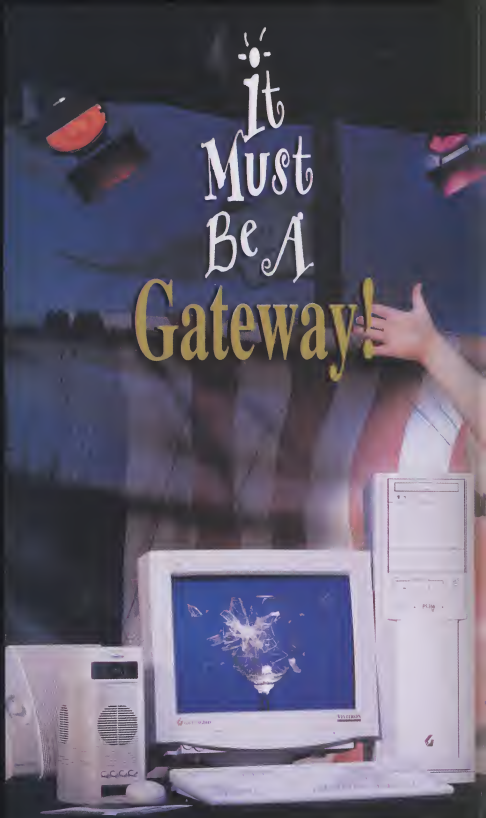

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And if it belts out power performance and sound like no other, then it's gotta be a Gateway 2000® computer! Gateway's high-end P5-166XL professional multimedia system gives you extraordinary performance, even for your most robust computing needs. Top it off with the Gateway-exclusive Altec™ Lansing ACS-400 speakers, and the P5-166XL ushers you into first-rate stereo sound! And our new P5-150 Professional system delivers the performance your heavy-duty business applications require — for just $2,899! The Intel® 166MHz and 150MHz Pentium® processors, included on these systems, are the fastest Pentium processors available today. These systems also include the new ATX motherboard, giving you enhanced functionality, usability and reliability.

An Encore 166MHz Performance

Bravo! Gateway's P5-166XL is *"the fastest* Windows 95 PC ever," per *Windows Sources*, February 1996. You'll leap to your feet when you experience all the powered-up features of the P5-166XL. This impressive system is built with 16MB EDO performance DRAM, 512K pipelined burst cache and 2GB hard drive for unbeatable performance.

Maestro of Multimedia

Spine-tingling, heart-thumping stereo sound resonates from your Altec Lansing ACS-400 speakers, standard on the P5-166XL and exclusively from Gateway 2000. Including the Altec ACS-250 subwoofer, these speakers give you thunderous bass and extraordinary Dolby® Surround Sound, breathing new life into all your multimedia applications and music CDs! And you'll be amazed by the ultra-realistic sound achieved with the included Ensoniq® Wavetable sound card. Add these performance features to a Matrox® 2MB WRAM graphics accelerator with MPEG video scaler and your 3-D graphics and multimedia applications will run with incredibly smooth video playback.

The Speedy 6X CD-ROM Drive!

Now standard on all Gateway Professional systems is the 6X CD-ROM drive. This super-fast CD-ROM drive accelerates all your computing experiences to the next level of CD-ROM technology and performance so your applications run ultra fast, *and* you'll be more than ready for tomorrow's complex software applications.

The Right System For All Your Hit Applications

All Gateway Pentium processor-based PCs include Microsoft® Windows® 95, and our Professional models also include MS Office 95, Professional Edition, compatible with 32-bit applications and with backward compatibility for 16-bit applications. If you prefer a different operating system, Gateway gives you a choice of MS-DOS® and Windows for Workgroups, Windows NT,™ or Windows 95, and we'll preload your operating system so your PC is ready to run!

Software Diva

The grand finale: The P5-166XL has one of the *best* software bundles found *anywhere* with MS Office 95, Professional Edition and Gateway's Generations II Software Collection for use with the Windows 95 operating system. It's just what you need for business applications in the Windows 95 environment, *and* for the most complete, updated versions of the latest and greatest multimedia applications, most optimized for Windows 95. A gaming pad is included for use with all your entertainment software.

And Introducing Gateway's P5-150 Professional PC!

For extraordinary levels of performance, Gateway introduces our P5-150 Professional system! It includes the ultra-fast 150MHz Pentium processor, 16MB EDO performance DRAM and 256K pipelined burst cache. All Gateway Professional Pentium processor-based systems have 16MB EDO performance DRAM, and most are standard with pipelined burst cache, adding up to the ultimate in system performance. These features also give you a faster, more cost-effective means to great performance. The P5-150 comes in a new "mini" tower case with similar expansion space found in a desktop case. Because the mini tower case is so compact, you can put it just about anywhere. Call Gateway 2000 today and find out about all our legendary performance machines!

If You're In Awe Of Your High-Flying Multitasking Machine...

The Gateway 2000® G6-200: A Legendary Performance

And if you just can't function without jet-set workstation power and performance — we're talking the top-flight machinery available today — then a new Gateway 2000 G6-200 is definitely for you! This new generation of workstations combines a 150MHz or 200MHz Intel® Pentium® Pro processor with Windows NT™ Workstation operating system and a configuration that'll send you soaring into the wild blue computing yonder!

Pilot Your 200MHz Pentium Pro

The Pentium Pro processor is Intel's latest generation processor designed to provide workstation users with ultra-high performance in true 32-bit environments. The Gateway G6-200 is classified as a value workstation, perfect for CAD applications, intense desktop publishing, and graphics and design applications. If you require a load of memory and storage space to run your heavy-duty network applications, you won't find a better value from any other workstation manufacturer.

High-Flying Performance Features

To achieve the high throughput and superior performance your intense applications require, we've included a 2GB Fast SCSI-2 hard drive on the Gateway G6-200. SCSI technology offers better performance in workstation environments. And the SCSI interface allows you to connect up to seven internal SCSI devices, so you can expand like never before. The G6-200 also includes an Adaptec® 2940 32-bit PCI Ultra SCSI Fast-20 controller. Combine all this with 64MB DRAM and your workstation applications will fly!

Gearing Up for Great Graphics!

With the Matrox® 4MB WRAM video card standard on our G6-200, you'll get incredible graphics support at higher resolutions, along with hardware accelerated 3-D support and increased color depth.

Workstation Wonderland with Windows NT Workstation

All right, Windows NT Workstation customers, you know who you are. And we want to get to know you! Gateway 2000 now proudly offers you the best value on the Windows NT Workstation 3.51 operating system in the industry, and standard on Gateway's G6 models. This is one of the most powerful operating systems for any organization that depends on a computer for today's most demanding data-intensive business applications. And if you value the reliability and security of privacy in large workstation environments, Windows NT Workstation is perfect for you.

Great news Windows NT 3.51 users! Your Gateway 2000 G6 system will arrive preloaded with Windows NT Workstation ready to run! Simply determine and enter your individual security codes and passwords during initial setup. We'll configure all G6 systems with the appropriate Windows NT 3.51 drivers, loaded and optimized for compatibility with Gateway hardware and software.

Along with Windows NT, you get MS Office 95, Professional Edition for the best 32-bit business software applications available. And you can upgrade Pentium processor-based and Pentium Pro processor-based PCs to Windows NT for a value that can't be beat!

Call today for more information on our new G6 computers.

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If You've Found The Ultimate Communications Device ...

And if your family has a penchant for the latest (*and coolest*) in multimedia, then it's just got to be a Gateway! All Gateway 2000® Family PC™ multimedia systems provide everything your family needs for education, entertainment and for your home office. And our TelePath® fax/modem with a Telephone Answering Device lets you reach out to neighbors next door or across the globe!

Out Of This World Performance and Features For Your Family!

Along with great multimedia features, the Gateway P5-120 Family PC system includes 16MB EDO performance DRAM and a 1.2GB EIDE hard drive. A 6X CD-ROM drive, standard on all Family PC systems, gives your family the power and performance to get down to serious business or to play thrilling multimedia games.

Holy amplifiers PC buyers! It's Gateway 2000's super stereo sound system: our exclusive Altec™ Lansing ACS-40 speakers and 16-bit Gateway sound card on Family PC systems. Your multimedia applications will blast off with realistic sound, and music CDs will be like *super* music to your ears!

Get Hooked Into MPEG Technology

We wouldn't lead you up an outdated technology tree. No way! Now all Gateway 2000 Family PC multimedia systems include MPEG (Moving Picture Experts Group) data compression technology. MPEG provides superior stereo sound, along with incomparable full-screen, full-motion video right from your CD-ROM drive. Video from MPEG multimedia applications will be smoother. And your multimedia images come to life when combined with the MPEG video scaler, standard on Family PC systems.

Reaching Out To New Worlds With The Gateway 2000 TelePath 28.8

Your communication needs are satisfied with the TelePath 28.8 fax/modem standard on most Gateway Family PC systems! The TelePath fax/modem state-of-the-art with the ability to fax, transfer files and access online services. But there's more! It's also a complete communications tool with a Telephone Answering Device (TAD) for answering machine capabilities. It also includes Gateway's exclusive Information Highway communications CD, with a user-friendly interface and easy-to-use tutorial of included trial memberships to CompuServe®, Prodigy®, America Online® and Reuters Money Network. You also get GNN (Global Network Navigator) for easy Internet access.

Gateway's Generations II Software Collection!

There's virtually no end to your family's educational and entertainment opportunities with the Gateway Generations II Software Collection, for use with the Windows® 95 operating system. Standard on Family PC systems and the P5-166XL, Generations II includes 45 of the latest versions of the world's most popular software applications such as MS Encarta® 96 and MS Cinemania® 96!

Industry-Wide, Prize-Winning Service and Support!

All Gateway systems come with our superb Gateway Gold™ service program for award-winning support, including toll-free technical support for the life of your Gateway computer. When surveyed, *Computer Shopper* readers answered "Gateway 2000!" unequivocally and bestowed us with *Computer Shopper's* 1995 Best Overall Hardware Service and Support award.

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Multimedia Systems

P5-100 FAMILY PC™

- Intel® 100MHz Pentium® Processor
- 8MB EDO Performance DRAM
- 1.2GB 9ms EIDE Hard Drive
- 2MB DRAM, 64-Bit PCI Graphics Accelerator with MPEG Video Scaler
- 6X EIDE CD-ROM Drive
- 16-Bit Gateway Sound Card
- Altec™ Lansing ACS-40 Speakers
- TelePath® 28.8 Fax/Modem with TAD*
- Gateway Information Highway CD
- 3.5" Diskette Drive
- CrystalScan®15 .28dp Color Monitor (13.9" viewable)
- 7-Bay Desktop Case
- 104° Keyboard & MS Mouse 2.0
- Microsoft® Windows® 95
- Generations II Software Collection
- Gateway Gold™ Service & Support

P5-100 $2099

P5-75 $1749

(75MHz Pentium processor, 1MB DRAM, 850MB HD, TelePath 14.4 fax/modem, CrystalScan14 w/ 13.4" viewable screen)

P5-120 FAMILY PC

- Intel 120MHz Pentium Processor
- 16MB EDO Performance DRAM
- 1.2GB 9ms EIDE Hard Drive
- 2MB DRAM, 64-Bit PCI Graphics Accelerator with MPEG Video Scaler
- 6X EIDE CD-ROM Drive
- 16-Bit Gateway Sound Card
- Altec Lansing ACS-40 Speakers
- TelePath 28.8 Fax/Modem with TAD*
- Gateway Information Highway CD
- 3.5" Diskette Drive
- Vivitron™15 .26dp Color Monitor (13.9" viewable)
- 7-Bay Desktop Case
- 104° Keyboard & MS Mouse 2.0
- MS Windows 95
- Generations II Software Collection
- Gateway Gold Service & Support

$2499

P5-133 FAMILY PC

- Intel 133MHz Pentium Processor
- 16MB EDO Performance DRAM
- 1.62GB 9ms EIDE Hard Drive
- 2MB DRAM, 64-Bit PCI Graphics Accelerator with MPEG Video Scaler
- 6X EIDE CD-ROM Drive
- 16-Bit Gateway Sound Card
- Altec Lansing ACS-40 Speakers with ACS-250 Subwoofer
- TelePath 28.8 Fax/Modem with TAD*
- Gateway Information Highway CD
- 3.5" Diskette Drive
- CrystalScan17 .28dp Color Monitor (15.7" viewable)
- 7-Bay Desktop Case
- 104° Keyboard & MS Mouse 2.0
- MS Windows 95
- Generations II Software Collection
- Gateway Gold Service & Support

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P5-166XL

- Intel 166MHz Pentium Processor
- 16MB EDO Performance DRAM
- 512K Pipelined Burst Cache
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- 6X EIDE CD-ROM Drive
- 16-Bit Ensoniq® Wavetable Sound Ca
- Altec Lansing ACS-400 Speakers with ACS-250 Subwoofer
- TelePath 28.8 Fax/Modem with TAD*
- Gateway Information Highway CD
- 3.5" Diskette Drive
- Vivitron17 .26dp Color Monitor (15.9" viewable)
- 12-Bay Tower Case
- 104° Keyboard & MS Mouse 2.0
- MS Windows 95
- MS Office 95, Professional Edition**
- Generations II Software Collection with Gaming Pad
- Gateway Gold Premium Service

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Professional Systems

P5-75

- Intel 75MHz Pentium Processor
- 16MB EDO Performance DRAM
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- 1MB DRAM, 64-Bit PCI Graphics Accelerator
- 6X EIDE CD-ROM Drive
- 3.5" Diskette Drive
- CrystalScan15 .28dp Color Monitor (13.9" viewable)
- 7-Bay Desktop Case
- 104° Keyboard & MS Mouse 2.0
- MS Windows 95
- MS Office 95, Professional Edition**
- Gateway Gold Service & Support

$1899

P5-120

- Intel 120MHz Pentium Processor
- 16MB EDO Performance DRAM
- 256K Pipelined Burst Cache
- 1.2GB 9ms EIDE Hard Drive
- 2MB DRAM, 64-Bit PCI Graphics Accelerator
- 6X EIDE CD-ROM Drive
- 3.5" Diskette Drive
- Vivitron15 .26dp Color Monitor (13.9" viewable)
- 7-Bay Desktop Case
- 104° Keyboard & MS Mouse 2.0
- MS Windows 95
- MS Office 95, Professional Edition**
- Gateway Gold Service & Support

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P5-133

- Intel 133MHz Pentium Processor
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- 256K Pipelined Burst Cache
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- 2MB DRAM, 64-Bit PCI Graphics Accelerator
- 6X EIDE CD-ROM Drive
- 3.5" Diskette Drive
- Vivitron15 .26dp Color Monitor (13.9" viewable)
- 7-Bay Desktop Case
- 104° Keyboard & MS Mouse 2.0
- MS Windows 95
- MS Office 95, Professional Edition**
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P5-150

- Intel 150MHz Pentium Processor
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- 256K Pipelined Burst Cache
- 1.62GB 9ms EIDE Hard Drive
- 2MB DRAM, 64-Bit PCI Graphics Accelerator
- 6X EIDE CD-ROM Drive
- 3.5" Diskette Drive
- Vivitron17 .26dp Color Monitor (15.9" viewable)
- 7-Bay Mini Tower Case
- 104° Keyboard & MS Mouse 2.0
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G6-150

- Intel 150MHz Pentium Pro Processor
- 32MB DRAM
- 256K Internal Cache
- 2GB 10ms EIDE hard drive
- Matrox 2MB WRAM Graphics Accelerator w/ Video Scaler
- 6X EIDE CD-ROM Drive
- 3.5" Diskette Drive
- Vivitron17 .26dp Color Monitor (15.9" viewable)
- 12-Bay Tower Case
- 104° Keyboard & MS Mouse 2.0
- MS Windows NT Workstation 3.51
- MS Office 95, Professional Edition**
- Gateway Gold Service & Support

$4299

G6-200

- Intel 200MHz Pentium Pro Processor
- 64MB DRAM
- 256K Internal Cache
- 2GB Fast SCSI-2 9ms Hard Drive
- Adaptec™ 2940 32-bit PCI Ultra SCSI Fast-20 Controller
- Matrox 4MB WRAM Graphics Accelerator w/ Video Scaler
- 4X SCSI-2 CD-ROM Drive
- 3.5" Diskette Drive
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Audio Multimedia Kits

Choose a Gateway 16-bit CD-quality sound card or an Ensoniq® Soundscape™ 16-bit wavetable sound card. Both are Sound Blaster™ compatible and include two Altec™ Lansing ACS-40 speakers.

$95 *(Gateway 16-bit sound card and Altec ACS-40 speakers)*

$155 *(Ensoniq Soundscape 16-bit wavetable and Altec ACS-40 speakers)*

Multimedia Speaker Upgrades

Add the all-new Altec ACS-250 subwoofer for up to 40 watts of additional bass.

$75 *(upgrade from systems which include Altec ACS-40 speakers)*

The Dolby® Surround Sound Gateway-exclusive ACS-400 speaker system will make your multimedia applications come alive with true theater-like surround sound. Complete with two Altec ACS-400 satellites and ACS-250 subwoofer.

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4X Three-CD Changer

Enhance the value and usefulness of your PC with a 4X three-CD changer. You'll have access to three times the amount of information of a single CD-ROM drive.

$40 *(upgrade from systems with 6X CD-ROM drive)*

Communications & Storage

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TelePath® 28.8 Fax/Modem with TAD

Internal fax/modem, 28,800bps modem, V.34, with 28,800bps fax capability. Sends and receives data and faxes, and includes Telephone Answering Device (TAD) for full voice mail capabilities. Includes trial memberships to CompuServe®, AOL and Prodigy® and more! **$149** *(TelePath 14.4 Fax/Modem $79)*

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CMS Jumbo 1400 internal tape backup unit with up to 1.36GB compressed (680MB native) storage capacity per tape. Comes with MS Windows and DOS® software, one tape and cable. **$199**

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Non-interlaced color monitor using Sony® Trinitron® tube technology, capable of 1280 x 1024 resolution.

Gateway Vivitron15 Color Monitor, .26 dot pitch (13.9" viewable)
Upgrade from a CrystalScan®14 (13.4" viewable) to Vivitron15 **$150**
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PCC Online/Adam Meyerson

Net Cash

One day your bank will disappear. No vaults, no tellers, no cash. Not because capitalism failed and the economy collapsed. But because digital commerce fixed the clunky, outmoded banking industry we all hate today. You'll still go to the bank, but it will be online. The changes are coming faster than you think.

This month we scoured the Internet for the top banks and financial resources. And we found hundreds, from U.S. giants like the Bank of America to Europe's power brokers.

Instant Statements Need your account balance right now? Wells Fargo Bank gives you up-to-the-minute statements for all your accounts via the Web. Maybe you need to find an ATM fast. Citibank's Web site provides step-by-step directions to the nearest cash machine. Bank of America lets you apply for a credit card with just a few clicks. And if you're interested in a loan, you can use its online-payment calculator. Elsewhere online you'll find interest and exchange rates, consumer-confidence ratings, gold prices, and the current federal budget deficit. All are updated daily, if not hourly.

Even the Internal Revenue Service is on the Web. Want to avoid last-minute post-office mobs? Or download a U.S. tax form? Check out the IRS's site. You'll find all tax forms there—from the 1040A to the 1099. For instant access just log on to the *PC Computing* Web page at www.pccomputing.com.

We'll also give you a look into the future of money, including the next generation of digital checks. The Financial Services Technology Consortium's (FSTC) Electronic Check project, a collaborative effort bringing together banking and computer experts, will create a digital replacement for your paper checks. For details, check out *PC Computing*'s online Web map. When you're done, give us comments on our popular new BBS. This gives you a direct line to the *PC Computing* staff and millions of PCC Online users. Have a question or suggestion? Drop us a note. We want to hear from you.

We've Got a Winner In our first online contest, five lucky readers received incredible new MultiSpin 4x4 CD-ROM changers from NEC Technologies. But it doesn't stop there. Upcoming contests will offer Windows 95 software, cutting-edge 3-D glasses, and lots of hardware surprises.

If that doesn't whet your appetite, Macromedia's Shockwave for Director will. It's the latest Internet technology breakthrough. Shockwave transforms the Web into a fully interactive CD-ROM-like experience. Web pages come to life with video and animation. We have dozens of sites for you to investigate on our Web map.

In our sneak-peek section you'll find all the latest products, including the new 166MHz Pentiums and a 200MHz Pentium Pro. You'll also get the scoop on ISDN adapters that access the Internet so fast you'll think you've broken the laws of physics.

Finally, for a little comic relief you'll find insightful CD-ROM reviews by *PC Computing*'s own witty and entertaining Ron White. Every month we're posting our popular CD-RON column. Don't miss it!

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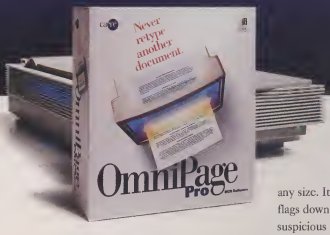

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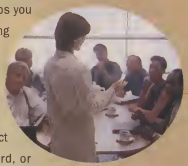

Step-by-step, the software helps you build the presentation. It shows you how to use the program. It helps you communicate more persuasively.

PowerPoint does the hard work of pulling the presentation together for you. Select from topics such as selling a product or writing a business plan, and the program will suggest an outline, design, and format for your presentation. The AutoContent Wizard will tailor your message according to how much time you have and the type of output you wish to generate (35mm slides, paper handouts, on-screen presentations). StyleChecker will help you avoid presentation mishaps by checking for readability and common mistakes in spelling or punctuation. And to add visual impact, AutoClipArt will scan for key words and suggest appropriate clips or images. If you have questions at any time, ask the Answer Wizard for help. You type in a question, and it will walk you through the task step-by-step. When your presentation is built, you can preview and edit how it will look in black-and-white print outs, and then use the Pack and Go Wizard to automatically package it on disks so you can take it on the road.

Microsoft

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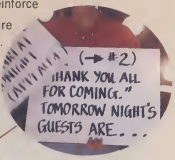
In both face-to-face meetings and remote presentations, PowerPoint puts you in command of the situation.

Even if your audience is on the other side of the world, you can still be in control. Presentation Conferencing lets you deliver and review your message with remote workgroups over a network. During the discussion stage, you can use the Slide Navigator to select specific slides from the presentation to reinforce the points you want to make, to answer spontaneous questions. And to make sure your meetings lead to constructive action, the Meeting Minder lets you take notes, record the minutes of a meeting, and assign action items on the spot. From start to finish, from building your case to making your point, Microsoft PowerPoint helps you prepare, helps you speak with confidence, helps you make the most of any meeting.



Now you can take full advantage of Windows 95.

Microsoft PowerPoint is designed to work hand-in-hand with Windows 95 technology like multitasking and multi-threading. (Now you can keep working while your presentation is printing.) It was designed to integrate seamlessly with the other programs in Microsoft Office. Together, the programs and the simplified user interface of Windows 95 make computing fundamentally easier. They make it easier for you to focus on your work, not on your software.

to see
answers where others only see numbers

Microsoft Excel for Windows 95.

Now you can see numbers from any angle. List them, chart them, sort them in ways that simplify analysis, that reveal the answers you need. With Microsoft® Excel, you can use AutoCalculate to find the sum, average, count, minimums, or maximums of specific cells simply by highlighting them. (You no longer create scratch formulas every time you need an answer.) To spot geographically based trends and relationships, use the mapping capabilities of Microsoft Excel to analyze sales by territory, for example. PivotTable® views let you rearrange the headings inside your spreadsheet to get a new view of your data. If you want to view revenues by product instead of by region, simply move the "product" heading and the entire table adjusts. And for people who value the different perspectives different people can offer, Microsoft Excel now lets multiple users enter and edit data in the same worksheet at the same time.

Everything from recalculations to pivot tables is faster. Routine tasks now happen automatically.

Answers appear in record time because formula recalculation, charting, cutting, pasting, and database operations are faster than ever. Up to 70% faster. And now that the software can sense what you are doing and complete the process for you, fewer steps are required to complete a task. AutoComplete, for example, speeds data entry by recognizing the first few letters of a repetitive entry and automatically finishing the word for you. Using the Template Wizard can help you get a head start on your work by turning existing spreadsheets into templates and by setting up an automated system to track important fields in a separate database. Nothing slows you down, not even questions. To find out the best, quickest way to do something, you ask the Answer Wizard. "How do I get this page to print sideways?" Type in the question and the Answer Wizard will show you how.

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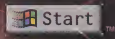

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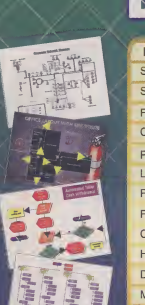

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Smart Symbol Libraries/Stencils	205	29
Fonts	150	0
Clipart	1,500+	0
Photos	1,000	0
Live repeating line patterns	YES	NO
Polygon tool	YES	NO
Fountain fills	YES	NO
Center and repeating arrows	YES	NO
Hyperlinks	YES	NO
Dynamic print preview	YES	NO
Multiple shadows	YES	NO
Thesaurus and Type Assist	YES	NO
Live auto-line routing	YES	NO
Script editor	YES	NO
Number of color models supported	8	2

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- Flow Charts
- Timelines
- Process Flow Charts
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CAN IBM COME BACK?

Big Boring Blue

As a former IBM employee, I was heartened to read John C. Dvorak's perceptive column ("Buzz Off," January, page 79). Hidebound middle management perpetuates IBM's troubles. Cutbacks inspired terror and created the illusion of progress, but when the fear subsided IBM reverted to business as usual. IBM workers need to start fighting for their jobs for IBM to make a strong comeback.

BRANDON MUSLER
VIA THE INTERNET

Cable Modem–Ready

Adam Meyerson's January column ("Prime Time," page 20) convinced me to bookmark *PC Computing*'s home page. However, my New Year's resolution is to get cable-modem access to zip around the Internet. My local cable company has been providing direct dial-up access to the Net in partnership with small telephone companies since December 1994. The cable company has been using cable modems since July 1995. The service is called ProLog and its Web site is http://www.ptd.net.

LARRY KISSLINGER
VIA THE INTERNET

STAY TUNED. We're intrigued by the promise of cable modems, but right now they're few and far between, and service is almost nonexistent. So far ISDN is the easiest service to get and set up. As cable-modem service becomes more widely available, you can be sure we'll test and report it here in *PC Computing*.

Another Way to the I-Way

I was glad to see "The Right Way to the I-Way" in your January issue (page 179). Many readers want Internet access, and you did a good job of summarizing the options. I have compiled a Web page called Internet Access Providers Meta-List that would be a good companion to your article. It contains pointers to over 100 local, national, and international lists of Internet access providers. The site can be found at http://www.herbison.com/herbison/iap_meta_list.html.

B. J. HERBISON
VIA THE INTERNET

Internet Integrity

My applause for your excellent feature "The 1,001 Best Web Sites" (December 1995, page 121). I was especially pleased to discover the many diverse topics highlighted in it. Your inclusion of religious sites, representing several views and not just one, was most welcome. I also appreciated the numerous social topics, including those that might be considered controversial. This breadth of coverage is a mark of fine journalism.

MARK PETERSON
VIA THE INTERNET

All the Web's a Stage

I just wanted to say thanks for selecting the Alabama Shakespeare Festival Web page as one of your top 1,001 Web sites. Your newsstand sales must have shot up after I told, faxed, and e-mailed just about everyone I've ever known or passed on the street about your feature. This honor is truly a big thrill for me and the theater, and is an inspiration to others: If I can create a top Web page, anyone can.

SARAH ROWELL
VIA THE INTERNET

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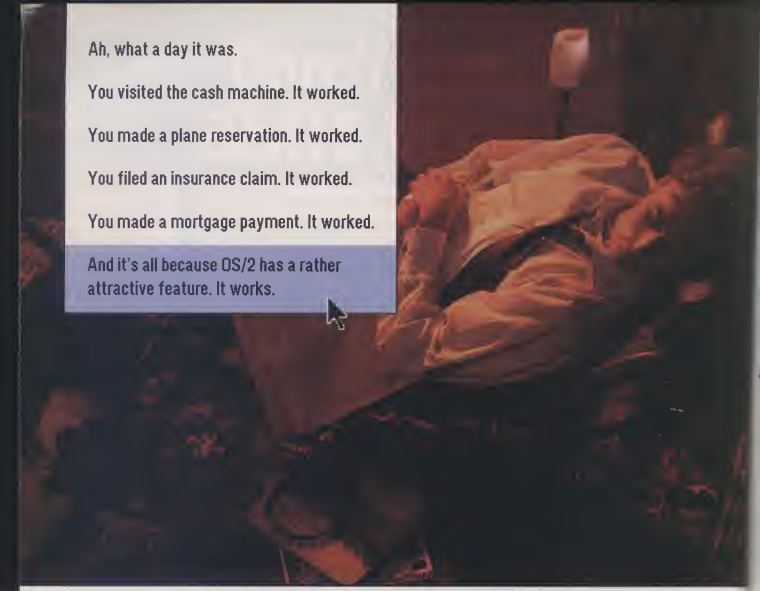

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Special Web Delivery

I appreciated your December 1995 guide to the best of the Internet ("The 1,001 Best Web Sites," page 121). Cybersurfing may be fun for some, but I often feel as though I'm ordering food at a strange restaurant without the benefit of a menu. However, I was disappointed that the U.S. Postal Service's Web site (http://www.usps.gov/) was not mentioned in your list. Your readers might appreciate the Address Standardization and Zip+4 lookup features at our site. I'm a dedicated postal employee, and I'm proud of our Internet presence. Please check out our site and pass it along.

ROCKY MATTHEWS
VIA THE INTERNET

An Oversite

In your December 1995 list of the 1,001 best Internet sites, you overlooked a major site in the Computers section under the Web-Authoring category. The site is called Matt's Script Archive (http://worldwidemart.com/scripts/), and it provides a terrific service to the Web community. All of Matt's CGI Perl scripts are well documented and free to the public. Many users have incorporated his scripts into their own Web pages. I think this site is a tribute to the true spirit of the Internet: information for the sake of knowledge, not for the sake of profit.

LEE BECKER
FORT COLLINS, COLORADO

E-Males

Your selection of the top 1,001 Internet sites included ten feminism Web pages but no masculine ones. Sites dealing with masculine issues do exist, but the public is largely unaware of them. If you're going to print feminist sites, I suggest you be fair and list http://www.mensdefense.org, a site for men.

R. F. DOYLE
THE MEN'S DEFENSE ASSOCIATION
VIA AMERICA ONLINE

Watt's Up with Speakers?

Your feature on PC speakers ("Sound Advice," January, page 173) contains a misconception that has plagued automobile and stereo speaker reviews for years: Watts can be heard. They can't. Wattage is definitely important to speaker designers, but it's entirely insignificant to listeners. The quality and loudness of what you hear has nothing to do with the power requirement of the speaker; it has to do with distortion. It would be more helpful to give us numbers that correlate with performance. Rating speakers by their wattage is like rating hard drives by their color.

JAMES K. CONDON
VIA THE INTERNET

THANKS FOR THE CLARIFICATION. You are correct; wattage cannot be heard, and it doesn't have a direct correlation to speaker loudness. Output level is determined by the speaker's sensitivity. However, all the speakers listed in our article are equipped with onboard power amplifiers. Amplifier-output levels do affect loudness, and the watts listed in the feature refer to those levels.

Slow Switching

Each month I see references in *PC Computing* about accessing the Internet at 28.8 kilobits per second (Kbps). But it's rare to get dial-up phone connections anywhere near that speed from many local telephone-company switching offices. I live in rural Missouri. I use a 28.8Kbps modem, but I have never been able to access the Net any faster than 24Kbps. Computer gurus and shop workers tell me that I am doing well if I get 24Kbps access to the Net on a regular basis. My local telephone company supports only 9,600 bits per second on local dial-up connections.

DONALD BROHM
VIA THE INTERNET

YOU'RE DOING PRETTY WELL— Your experience is typical of the performance commonly seen with a 28.8Kbps modem today. Most phone companies' switching equipment is designed to handle only 9,600bps. So pushing it to 24Kbps, or even occasionally to 26Kbps, is the best we've seen. Here at *PC Computing* we've been experimenting with ISDN adapters. With ISDN service 57.6Kbps access is the baseline, and updates to most models will double that speed in the next few months.

It's
Connected
To A
600x600 dpi
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Introducing the Modem Blaster 28.8 Series

Superb quality. Dependability. High performance. Compatibility. Unbeatable software value. That's what made Sound Blaster #1.

Now the makers of Sound Blaster bring you a new wave of powerful modems with a new series of Modem Blaster 28.8 products. Our remarkable Modem Blaster line includes a modem and NetManage internet software, on-line services and best-selling games, making it easy for you to instantly surf the net, browse the web, chat online and wage modem battles head-to-head. And all at the fastest modem speed available.

Modem Blaster 28.8 Hardware Features
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* 115,200 bps data throughput
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Other modems will leave you all wet. Modem Blaster 28.8 will let you ride the exciting new wave of PC communications. For more information, call our Fax Back service at 408-428-2389 or check out our home page at http://www.creaf.com.

Modem Blaster 28.8 External — Effortless installation, sleek external case and easy-to-read displays make this ideal for users who want to save a slot in their PC.

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Modem BLASTER

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Circle 107 on reader service card.

Mail BY PHONE, FAX, NET & POST:
Super Scanner · Zipping Along · Fair Share

Scanned Over

When you listed the least expensive color flatbed scanners available (January, Pulse, page 33), your staff clearly hadn't done its homework. Envisions Solutions Technology has several scanners worth considering that can be purchased by mail order. I have the ENV8800S. It does everything Hewlett-Packard's ScanJet 4C does, only it's faster and costs less money.

J. J. Stewart
via CompuServe

STAY TUNED for our scanner roundup in the Graphics Superguide coming in our April issue.

Advanced Access, Please

In your January Windows 95 database roundup, the section on Microsoft's Access 95 ("Access 95: Better Help, Consistent Interface," page 168) sets out to determine whether Access 95 and Lotus's Approach 96 are easy enough for untrained office workers even though these programs have sufficient high-end features for power users. But your article bases its findings on the impressions of novice usability testers. This is hardly the full-spectrum analysis that you intended to provide. What about the programming language? How well do the programs handle multiple users? These are a few of the many questions that power database users would love to see answered in your magazine.

Brian P. Clausen
via the Internet

OUR DATABASE USABILITY testing included both novice and advanced database users. We took both groups' success rates and opinions into consideration when we determined the winner. Your points about programming language and multiuser support are well taken, but they are beyond the intended scope of the article.

Don't Zap the Zip Drive

In your January Mail section ("EZ to Disagree," page 27), I find Marc C. Levine disagreeable, as well as a bit misguided. He says that Iomega's Zip drive can be used only for backup and that SyQuest's EZ135 is the drive for running programs. But applications can also be accessed from the Zip drive. I find my Zip drive handy for seldom-used programs.

Dave Munroe
via America Online

THE ZIP DRIVE is not only for backup. With a SCSI connection, the Zip drive and the EZ135 can run programs at about the same speed: slow. (With a parallel port, the Zip drive is even slower.) These portable drives are faster than floppy disks, but they can't compare to an internal hard drive. To save space, less important programs can be stashed and run from a portable drive, but save treasured applications for your main drive.

Making the Upgrade

At the end of your January Mail section (page 28) you ask, "How soon do you plan to upgrade to a new system and why?" For the past ten years, I used a Commodore 64 to help me with my teaching job. Last summer, I upgraded to a PC. It was like switching from an oxcart to a spacecraft. I'm running Windows 95, and I'm able to do the same things I did with my Commodore 64 in a fraction of the time.

David J. DuFault
Atikokan, Ontario

Full Shareware

I have noticed a disturbing trend with shareware. While it is a great alternative to a $500 software package, more and more shareware programs are showing up with some critical functions taken out of them. I cannot justify spending even a *small* registration fee for most shareware packages if I can't test the full version. I understand that shareware writers need monetary compensation for their efforts. But if they're going to release a crippled version and then expect me to pay more for the whole thing, they should contact a retailer and try to sell it in stores. They should stop wasting everyone's time.

James Ballentine
via the Internet

THAT'S THE WHOLE POINT: Try before you buy. If you don't like "crippleware," then don't buy it.

You're Already Thinking About Upgrading To Something More Powerful.

Speed Up Online

A letter in your January Mail section ("Our Secrets, Your Results," page 23) refers to the Windows 95 Superguide featured in your October 1995 issue. Windows 95 runs horribly slowly on my system. The tips in your Superguide could help me increase my system's speed. Can I access the Superguide through your Web page?

BRAD BRESSLER
VIA THE INTERNET

ABSOLUTELY! In fact, you can find our entire Windows 95 Superguide with speedup secrets located in the features section at our Web site (http://www.pccomputing.com).

Ooh–Thanks!

I would like to congratulate you for being the most informative and technologically aware PC magazine on the market today. Not a single issue has passed that I have not read and found myself *oohing* and *aahing* at your stories. Please keep up the good work!

FRANK H. TREECARTEN
VIA THE INTERNET

Log-on Jam

I thoroughly enjoyed your January issue, but your response to Milt Burns's letter ("A Tangled Web," Mail, page 23) was typical overselling of the Web. Slow connection speeds are frustrating—no matter how you access the Net. Some providers are attempting to create an exclusive T3 network, but far-end server connections are still slower. It's like driving 90 miles per hour to the mall, only to wait in a long line at a store counter. I use a T1 connection at work, but it doesn't even matter when everyone decides to read their e-mail at the same time.

DAILY MCDOWELL
VIA THE INTERNET

Net Style

We have an Internet site that might be of interest to fashion buffs. The page focuses on how to achieve a better fashion lifestyle—from Armani runway shows to expert advice columns to fashion press kits. If anyone is interested they should take a look at http://www.fashionmall.com.

BEN NARASIN
VIA COMPUSERVE

For the Record

In our January feature ("The Direct 60," page 148), the table should have listed the tech-support number for Computer Discount Warehouse as (800) 383-4239 and the BBS number as (708) 465-6899.

Our December 1995 review of Wessex's First St. ("Put Your Business on the Map," page 112) should have referred to the bundled software as ESRI's ArcView version 2.

WHERE DO YOU E-SHOP? Send your thoughts about this and other subjects to Mail, *PC Computing*, 950 Tower Lane, 19th Floor, Foster City, CA 94404; fax: (415) 578-7059; Internet: 72241.1724@compuserve.com; or CompuServe: 72241,1724.
Letters are subject to editing for length and clarity.

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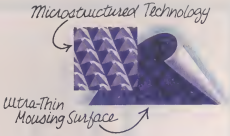
Circle 186 on reader service card. Dept. E7

So Why Would You Still Be Relying On That Totally No-Tech Mouse Pad?

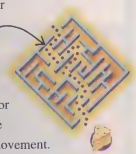
The 3M™ Precise Mousing Surface.

Until now, you had no choice.

But 3M just invented the first tracking surface with technology built in. Technology that actually improves the performance of your mouse.



The unique microstructure, with its microscopic peaks and valleys, gives you tracking control like you've never felt before.



You experience more exact cursor placement, more efficient hand movement. To call it WYPIWYG (Where You Point Is Where You Go) is something of an understatement. The microstructure keeps your mouse ball cleaner as it rolls by. Improving performance even more. In addition, our low-profile mousing surface integrates smoothly with your work surface.

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3M *Innovation*

Circle 102 on reader service card.

It's 11:00 am.

Do *you* know where *your* PCs are?

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ServerWORKS Manager, a brand new product from Digital, gives you both server and LAN management capabilities in one product. It lets you manage and configure your network of PC desktops, print/file and application servers, bridges, HUBS, routers and switches from anywhere on the LAN. It lets you identify, locate and solve potential issues before they become problems. Thanks to the Windows®-based interface, ServerWORKS Manager provides in-depth analysis in an easy-to-read format. Its open architecture makes for easy integration of third-party applications. And you also get customized alarm and alert capabilities, plus autodiscovery to eliminate manual tracking of network devices. Whatever your server operating environment — NetWare®, NT®, or SCO® UNIX® — ServerWORKS Manager will help you keep it healthy and trouble-free. And what's more, Digital supplies ServerWORKS Manager gratis with all Pentium® processor Digital Prioris™ PC Servers.

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ClientWORKS is an extraordinary family of industry-standard software tools that lowers your cost of ownership by allowing you to inventory and manage PC desktops across a variety of operating systems and network environments. It supports the Desktop Management Interface (DMI), which was developed by a consortium of computer companies including Digital. Plus, it includes a unique utility which makes DMI data available to Microsoft Systems Management Server™. ClientWORKS supports Windows NT™, Windows®, WFW™, and Windows® 95. It works in a wide range of network environments, including NetWare® and NT™ Server using SNMP and Remote DMI. For the low cost of nothing, you'll be able to solve problems remotely, use your equipment more efficiently, and reduce the amount of manpower for configuration.

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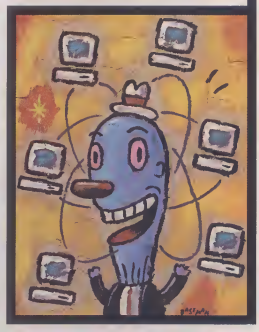

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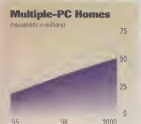
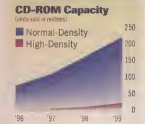
Pulse

Apps on the Net, Cable

Surfing Cents: Are you paying too much for basic Internet access? According to Dataquest, most people on the Net have a bill of less than $25 a month.



Full House: Forget buying a second television—the number of families with more than one PC in their home will double in the next five years.



Gigs on CD: High-density CD-ROM drives put 9.4GB of data—or the equivalent of a full-length, full-screen MPEG movie—on your PC. Watch for them this year.

NEW TECHNOLOGIES

Java Stirs Up the Web

Among all the epic rumblings about the World Wide Web's future, Sun Microsystems' programming language, Java, is one of the few new technologies that actually lives up to its promise of revolutionizing how the Web (and your computer) works.

Unlike with other Internet authoring tools, including Macromedia's Shockwave for Director and Adobe's Acrobat plug-in, the appeal isn't limited to the multimedia sizzle of 3-D audio and video. Java creates actual programs, called applets, that can do nearly anything the applications sitting on your hard drive can. They're smaller, though, and reside on the Internet rather than your hard drive.

It's an idea that has spawned an industry-wide debate over the future of personal computing. Because mini Java applets let you harness the resources of some 2 million Internet mainframes, some predict PCs will be downsized to dumb terminals, with no hard drive (or Windows operating system) needed—all the actual computing and processing would be handled on the Internet (see "Internet Appliances," I-Way Patrol, page 291). The mere existence of Java is making software developers refocus on more user-centric applications.

Soon to become an object-oriented language with the complex programming features stripped out, Java lets developers easily create small but high-impact applets resistant to viruses and tampering. Plus, Java applets require little bandwidth on their journeys across the Internet. At last count, there were more than 800 Java programs percolating—many due by midyear.

Naturally, that includes a potful of 3-D Web browsers designed to recognize rich audio and video content as well as hyperlinks. Also expect to see any number of online services full of real-time audio-video updates of stocks and sports scores. Ditto

Building Blocks: Java creates small but high-impact applets that reside on the Web instead of your hard drive.

PHOTO ILLUSTRATION BY TIMOTHY EDWARD DOWNS

UPDATES Best Bets and Bargains

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Add a laptop-style eraser-head pointer to your desktop with the $30 DeskStick joystick mouse. Contact Interlink at (800) 340-1331.
Reader Service No. 601

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Reader Service No. 602

INFO CATCHER
Quickly organize all your Web-site info interactively with askSam 3.0, a free-form database for $149. Contact askSam at (800) 800-1997.
Reader Service No. 603

17-INCH EYE-OPENER
See just how good Windows can look with the high-resolution AlphaScan 760 monitor ($845). Contact Sampo at (770) 449-6220.
Reader Service No. 604

Modems Arrive

for Web sites devoted to the collection of interactive-information, such as a site that lets you fill out loan forms online.

Since Java breaks programs into small, interchangeable chunks, you may soon be able to load a chart maker from the Web into a spreadsheet without ever installing it on your hard drive. Java's ability to execute small tasks lowers the overhead for virtual-reality and other high-bandwidth applications.

This approach is a serious departure from Microsoft's traditional big-boat approach to computing—as is behind its Office suite, which dominates your PC's resources such that developers view it as a de facto programming environment. They're readying Office applets, while Microsoft continues to make the suite increasingly project-centric so you can mingle its different data types in a single container document. A future Office version may be intelligent enough to analyze how you work, and send agents scurrying across the Internet to fetch you this research paper or that airline schedule. This would provide Java-like functionality within the context of the Windows environment we've come to know and love.

So what's it going to be? Small terminals that let servers do all the work, or bigger and meaner PCs that can process at the speed of sound? Whoever wins the debate (and these two scenarios are not mutually exclusive), count on the Internet being an indispensable part of the mix. **MH**

Contributors to Pulse: KYLA K. CARLSON, JAMES OLIVER CURY, MIKE HOGAN, SCOTT NAYLOR, RICH SCHWERIN. *Edited by* JACK LYON.

Two-Way Cable Speed

Since analog modems have **maxed out** on speed, people are eagerly awaiting cable modems, which promise to be **125 times faster.** The only problem: The majority of the U.S. coaxial-cable network is **send-only,** making interaction impossible. **General Instrument's Surfboard** solves that problem. The modem receives data via cable lines, but sends over conventional analog phone lines. JL

Surfboard / General Instrument / (800) 523-6678 / $300 est. street price / *Reader Service No. 605*

Portable Printers

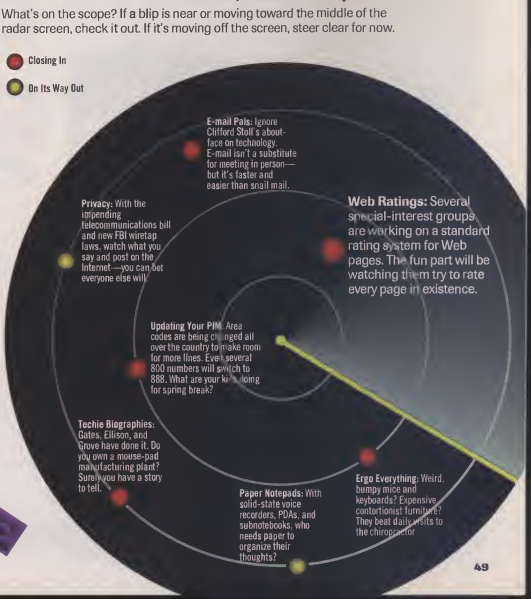
They're lean, mean, portable printing machines. Here are the least expensive color and black-and-white portable printers we could find as of December 19, 1995.

Product	Price
Canon BJ30 *Computer Discount Warehouse (800) 886-4239*	$259
Hewlett-Packard DeskJet 340 *PC Compleat (800) 598-4727*	$289
Citizen PN60 *Office Depot (415) 572-2561*	$299
Canon BJC70 (color) *Bulldog Computer (800) 438-6039*	$339
ATI SlimWriter *Atlantic Technologies (800) 779-7705*	$219

Reader Service Numbers: Computer Discount Warehouse, *606;* PC Compleat, *607;* Office Depot, *608;* Bulldog Computer, *609,* Atlantic Technologies, *610.*

RADAR: No More Secrets, An End to Paper Cuts

What's on the scope? If a blip is near or moving toward the middle of the radar screen, check it out. If it's moving off the screen, steer clear for now.



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32-bit Windows™ 95 graphics application, offering fully-featured applications for illustration, photo-editing and bitmap creation, business and multimedia presentations, 3D rendering and animation.

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PC Magazine, November 7, 1995

In a recent study[1], **CorelDRAW scored an overwhelming satisfaction level of 93%!** "CorelDRAW scored the highest in satisfaction out of all packages mentioned," said Chris Le Tocq, analyst with Soft-Tracks in Los Altos, California. "Users of graphics software have a wide variety of mature and well-crafted packages to choose from ...CorelDRAW is definitely a leader in its field."

PRODUCT	SATISFACTION
CorelDRAW	**93%**
AutoDesk AutoCAD	91%
Symantec Norton Utilities	91%
Adobe Photoshop	89%
Claris ClarisWorks	89%
Lotus Ami Pro	89%
Microsoft Office	87%
Aldus PageMaker	86%
Microsoft PowerPoint	86%
Meca MYM	85%

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Winner of over 200 international first-place awards, including 20 **Reader's Choice Awards** CorelDRAW has set a shining example in the critical area of customer satisfaction.

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[1]Home Office Marketing Essentials (HOME) Study, conducted by the California-based Infotech Group.
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HLDP-0L0.D

The A-List

Editors' Top Picks by Wendy Taylor

		Top Pick	The Buzz	The Stats*	More Info
Systems	High-Performance Pentium	Dell Dimension XPS P166c	**Ultrafast Windows 95 performance at a price that won't give you a nosebleed.**	$3,749, 166MHz Pentium, 16MB RAM, 1.2GB, 6X CD-ROM.	This issue, page 132 (800) 433-2318 Reader Service No. 618
Systems	High-Performance Pentium Pro	Hewlett-Packard Vectra XU 6/150	**So fast it will rock you back on your heels. Feed it native 32-bit apps only.**	$7,200, 150MHz Pentium Pro, 32MB RAM, 2.1GB hard drive.	This issue, page 132 (800) 752-0900 Reader Service No. 619
Systems	Desktop Workhorse	Micron Electronics P133 Millennia	**Why compromise? Get the performance you crave and all the extras too.**	$3,048, 133MHz Pentium, 16MB RAM, 1.6GB, 6X CD-ROM.	Sept. 1995, page 106 (800) 515-9197 Reader Service No. 620
Systems	Low-Cost Desktop PC	Dell Dimension P75t	**First-rate features at a cut-rate price—our favorite combination.**	$2,029, 75MHz Pentium, 16MB RAM, 1GB, 4X CD-ROM.	Stay tuned (800) 433-6675 Reader Service No. 621
Systems	SOHO System	Compaq Presario 9564	**Command central for any home office—manages your fax, voice, and e-mail messages while you get down to work.**	$3,498, 133MHz Pentium, 16MB RAM, 1.6GB hard drive.	Feb. 1996, page 82 (800) 345-1518 Reader Service No. 622
Systems	High-Performance Workstation	IBM Power Series 850	**Workstation might meets Pentium prices in this PowerPC rocket.**	$6,796, 133MHz PowerPC 604, 32MB RAM, 1GB hard drive.	Nov. 1995, page 71 (800) 472-7693 Reader Service No. 623
Systems	Pricewise Direct System	Polywell Poly 500P8	**The most PC for your money—delivered right to your doorstep.**	$2,848, 133MHz Pentium, 16MB RAM, 4X CD-ROM drive.	Jan. 1996, page 132 (800) 999-1278 Reader Service No. 624
Network Servers		Compaq ProSignia 300 5/90	**Who needs an information systems department? This server is so well designed, it runs itself.**	$5,434, 90MHz Pentium, 32MB RAM, 2GB hard drive.	Nov. 1995, page 138 (800) 345-1518 Reader Service No. 625
Network Servers		Digital Prioris LX 590	**Our labs call it the fastest server to hit our test bench; we call it a great deal.**	$4,418, 90MHz Pentium, 192MB RAM, 4X CD-ROM drive.	Dec. 1995, page 158 (800) 344-4825 Reader Service No. 626
Network Servers		Compaq ProLiant 1500	**A reliable anchor for 15 or more network nodes.**	$16,212, 100MHz Pentium, 128MB RAM, two 2.1GB SCSI-2 drives.	Nov. 1995, page 138 (800) 345-1518 Reader Service No. 627
Network Servers		Hewlett-Packard NetServer 5/133 LS2	**Two onboard processors and loaded with technical wizardry.**	$25,095, two 133MHz Pentium CPUs, 768MB, five 2.1GB SCSI drives.	This issue, page 158 (800) 322-4772 Reader Service No. 628
Portables	Portable Desktop Replacement	Toshiba Tecra 700CT	**The follow-you-around office: 120MHz Pentium, removable four-speed CD-ROM drive, and an 11.3-inch hi-res display.**	$5,999, 120MHz Pentium, 16MB RAM, 1.13GB hard drive.	This issue, page 68 (800) 999-4273 Reader Service No. 629
Portables	Lightweight Traveling Notebook	Toshiba Portégé 610CT	**Take it anywhere: Toshiba's 4.8-pound ultraportable Pentium fits in any briefcase—with room to spare.**	$3,999, 90MHz Pentium, 8MB RAM, 686MB hard drive.	Dec. 1995, page 158 (800) 999-4273 Reader Service No. 630
Portables	Low-Cost Color Portable	Texas Instruments Extensa Model 450	**All the extras of Dell's Latitude and Toshiba's Satellite for hundreds less. Let the price wars begin!**	$1,998, 75MHz 486DX4, 8MB RAM, 340MB hard drive.	This issue, page 282 (800) 848-3927 Reader Service No. 631
Portables	Multimedia Notebook	Gateway 2000 Solo S90	**Big, high-resolution screen; removable CD-ROM drive; and wired for sound.**	$4,599, 90MHz Pentium, 16MB RAM, 1.2GB hard drive.	Nov. 1995, page 74 (800) 424-0854 Reader Service No. 632
Portables	State-of-the-art Portable	IBM ThinkPad 760CD	**When you demand the ultimate: full-screen hardware MPEG and a high-resolution 12.1-inch display.**	$7,449, 120MHz Pentium, removable CD-ROM drive.	This issue, page 183 (800) 426-7255 Reader Service No. 633

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The A-List

Continued on page 54

		Top Pick	The Buzz	The Stats*	More Info
Desktop Printers	Desktop Laser Printer	Hewlett-Packard LaserJet 5MP	**You can buy a faster laser, but not a better one. Plus, who needs cables? Beam jobs to the IR port instead.**	$950, 6 ppm, 600 dpi, PCL 5 (PostScript optional), infrared port.	Oec. 1995, page 158 (800) 752-0900 Reader Service No. 634
	Low-Cost Color Printer	Canon BJC-4100	**Low-maintenance, high-quality color—and priced for mortals.**	$369, 720-by-360-dpi black, 360-by-360-dpi color.	Feb. 1996, page 140 (800) 848-4123 Reader Service No. 635
	Desktop Color Printer	Hewlett-Packard DeskJet 855C	**Near-laser-quality color output for a tenth of the price.**	$499, 600 dpi, 7 ppm black, 3 ppm color.	Feb. 1996, page 140 (800) 752-0900 Reader Service No. 636
	Portable Printer	Citizen PN60	**Slip it in your briefcase, then wow clients when you produce color pages on the spot.**	$339, 300-dpi thermal transfer, 1.5 pounds.	Feb. 1995, page 64 (310) 453-0614 Reader Service No. 637
Network Printers	[illegible]	Hewlett-Packard LaserJet 5Si MX	**Even 50-page print jobs fly out faster than you can trot down the hall to claim them.**	$4,000, 24 ppm, 600 dpi, PCL 5e, PostScript Level 2.	Jan. 1996, page 89 (800) 752-0900 Reader Service No. 638
	[illegible]	Tektronix Phaser 340	**Drop-dead, solid-ink color at just 11 cents per page.**	$4,995, 4 ppm, 600-by-300-dpi black and color.	Oec. 1995, page 158 (800) 835-6100, ext. 1253 Reader Service No. 639
	[illegible]	Hewlett-Packard DeskJet 1600C	**Churns out brilliant color pages faster than you can produce them.**	$1,400, 9 ppm black, 4 ppm color.	Stay tuned (800) 752-0900 Reader Service No. 640
Video	High-Resolution 20- or 21-Inch Monitor	Nanao FlexScan T2-20	**It's like buying orchestra seats for Windows—and worth every penny.**	$2,063, 20-inch, 1,600 by 1,200 pixels, Plug and Play.	Dec. 1995, page 158 (800) 800-5202 Reader Service No. 641
	High-Resolution 17-Inch Monitor	Sony Multiscan 17sf	**Sweet 17-inch deal. Looks great, too.**	$850, 1,280 by 1,024 pixels at 60Hz.	Dec. 1995, page 158 (800) 352-7669, ext. 119 Reader Service No. 642
	High-Resolution Graphics Accelerator	Matrox MGA Millennium	**Ultrafast Windows RAM and 3-D acceleration make this the graphics accelerator to covet.**	$450, 4MB WRAM, 1,280 by 1,024 pixels at 76Hz, PCI interface.	Dec. 1995, page 158 (800) 583-4353 Reader Service No. 643
Storage	Removable Storage	Iomega Zip Drive	**Chic, purple, and portable. And the cartridges are removable.**	$199, 25MB or 100MB cartridges, SCSI or parallel interface.	Feb. 1996, page 175 (800) 697-8833 Reader Service No. 644
	CD-ROM Drive	NEC MultiSpin 4Xc	**The best bargain around: Queue up seven discs in this quad-speed jukebox for the price of a single-disc drive.**	$349, SCSI interface, seven-disc changer.	Dec. 1995, page 158 (800) 632-4636 Reader Service No. 645
	Hard Drive	Seagate Medalist 2140	**Be greedy. At these prices, why not get two?**	$530, Fast ATA-2, 10.5ms access time, 2.51GB storage.	Stay tuned (408) 438-8111 Reader Service No. 646
	Network Storage	Mega Drive Systems MR5 RAID Disk Array	**The best kind of insurance for your network data.**	$11,000, 5GB RAID array.	Nov. 1995, page 186 (800) 404-6342 Reader Service No. 647
Peripherals	Personal Scanner	Visioneer PaperPort Vx	**The quickest way to tame your paper in-box—moves paper off your desk and onto your hard drive in seconds.**	$359, 400-dpi scanner, document-management software.	Jan. 1996, page 92 (800) 787-7007, ext. 102 Reader Service No. 648
	Multimedia Sound Card	Creative Labs Sound Blaster AWE32 PnP	**The ultimate for business multimedia. Great for games, too.**	$229, 32-voice polyphony, 16-bit DSP.	Jan. 1996, page 173 (800) 998-5227 Reader Service No. 649
	High-speed Fax Modem	U.S. Robotics Courier I-Modem	**A bridge to the future—get a 28.8Kbps analog and ISDN modem in one.**	$895, ISDN and V.34 (28.8Kbps).	Feb. 1996, page 78 (800) 877-2677 Reader Service No. 650

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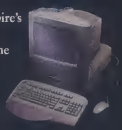

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The A-List

Continued from page 52

		Top Pick	The Buzz	The Stats*	More Info
Desktop Applications	Software Suite	Microsoft Office for Windows 95	**The complete business-software suite for Windows 95.**	$499 (Standard Edition), 28MB to 89MB hard disk space.	Sept 1995, page 83 (800) 426-9400 Reader Service No. 651
	Word Processor	Lotus Word Pro 96	**Microsoft's Word comes close, but smart spell-checking and version control give Word Pro 96 an edge.**	$75, Windows 95 or Windows NT 3.51, 8MB RAM.	Dec. 1995, page 158 (800) 343-5414 Reader Service No. 652
	Spreadsheet	Microsoft Excel for Windows 95	**While Quattro Pro and Lotus 1-2-3 languish in the 16-bit world, Excel steals the 32-bit show.**	$339, Windows 95 or Windows NT 3.51, 8MB RAM.	Dec. 1995, page 158 (800) 426-9400 Reader Service No. 653
	Database	Microsoft Access for Windows 95	**The database usability and productivity champ—for novices and experts alike.**	$339, 486 CPU, 12MB RAM.	Jan 1996, page 162 (800) 426-9400 Reader Service No. 654
Business Applications	[illegible]	Microsoft PowerPoint for Windows 95	**Build a winning sales presentation on your lunch hour.**	$300, Windows 95 or Windows NT, 14MB to 35MB hard disk space.	This issue, page 183 (800) 426-9400 Reader Service No. 655
	[illegible]	Microsoft Publisher for Windows 95	**The ultimate vanity press: Create terrific-looking pages without even trying.**	$80, 386 CPU, 8MB RAM, 6MB hard disk space.	Dec. 1995, page 158 (800) 426-9400 Reader Service No. 656
	[illegible]	QuarkXPress 3.31 for Windows	**Produces pages as slick as the ones in your hands. PageMaker shops should check out PageMaker for Windows 95.**	$600, 486 CPU, 8MB RAM, 12MB to 15MB hard disk space.	Dec. 1995, page 158 (800) 788-7835 Reader Service No. 657
	[illegible]	CorelDraw 6	**The all-in-one graphics toolkit for Windows 95: Draw, edit, and design your own masterpieces.**	$439, Windows 95, 486 CPU, 8MB RAM.	Dec. 1995, page 158 (800) 772-6735 Reader Service No. 658
	[illegible]	Adobe Photoshop 3.0 for Windows	**A digital darkroom for your PC. The Windows 95 version is just around the corner.**	$670, 486 CPU, 8MB RAM, 20MB hard disk space.	Nov. 1994, page 106 (800) 833-6687 Reader Service No. 659
Finance	Personal Finance	Intuit Quicken Deluxe 5 for Windows	**Never visit a bank again—this is branch-office checking from your hard drive.**	$60, 386 CPU, 4MB RAM, 7MB hard disk space.	Feb. 1996, page 159 (800) 624-8742 Reader Service No. 660
	Business Accounting	Intuit QuickBooks Pro 4.0	**Cheaper than your average accountant, and a lot easier to understand.**	$189, 486 CPU, 4MB RAM, 12MB hard disk space.	Feb. 1996, page 92 (800) 624-8742 Reader Service No 661
Communications	Fax-Communications Software	Delrina CommSuite 95	**One launchpad for all your Internet fixes. Sends e-mail and faxes, too.**	$99, 486 CPU, 8MB RAM, 30MB hard disk space.	Nov. 1995, page 83 (800) 441-7234 Reader Service No. 662
	Web Browser	Netscape Navigator 2.0	**Still the best way to explore the Web. Download the new Windows 95 version from ftp://ftp.netscape.com.**	$49, Windows 95, 4MB RAM, Internet access.	Jan 1996, page 108 (800) 638-7483 Reader Service No. 663
Tools and Utilities	Antivirus Software	Symantec Norton AntiVirus for Windows 95	**Fast and painless virus hunting for Windows 95 and Windows 3.x.**	$79, Windows 95, 486 CPU, 8MB RAM.	Oct. 1995, page 116 (800) 441-7234 Reader Service No. 664
	Project Manager	Microsoft Project for Windows 95	**Takes the work out of teamwork—the easy way.**	$469, Windows 95, 386 CPU, 20MB hard disk space.	Dec. 1995, page 158 (800) 426-9400 Reader Service No. 665
	System Utility	Symantec Norton Utilities for Windows 95	**Resuscitates dead files and diagnoses hardware problems before they happen. Everyone should have a copy.**	$90, Windows 95, 486 CPU, 8MB RAM.	Dec. 1995, page 158 (800) 441-7234 Reader Service No. 666
	Reference	Vicarious Our Times	**The best crash course in 20th-century history we've ever taken. Don't miss it.**	$70, Windows 3.1, 486 CPU, 8MB RAM, CD-ROM.	Feb. 1996, page 301 (800) 465-6543 Reader Service No. 667

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BYTE/NSTL LAB REPORT June 1995
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EDITOR'S HomeOffice PICK

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PC MAGAZINE March 14,1995

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ANALYST CHOICE

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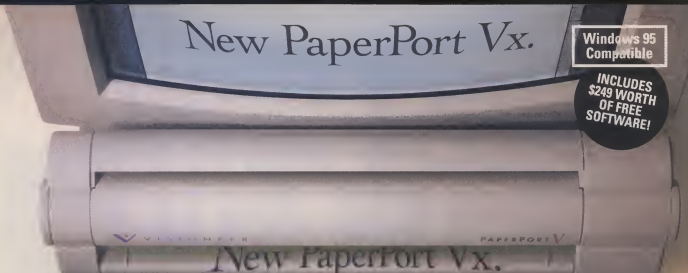

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Paul Somerson

Equal Time

OK, life's unfair. Size matters. Bigger is better. Giant companies have all sorts of advantages over little ones. Ever negotiate with lawyers at a huge company? If they saw you drowning 100 feet from shore, they'd throw you a 51-foot rope and say they **WENT MORE THAN HALFWAY.** Then they'd eat you alive. With these guys, if you're a small fish, once there's blood in the water you're basically shark food. Until the giants get onto the Web. Then suddenly Goliath starts to look like a big, slow, dumb target.

When it comes to the Internet, most big companies are clueless. Many of them have internal departments that create amateur-hour home pages that are **DULL AND DOPEY** from day one. Others pay fortunes to Web hustlers who produce dismal cookie-cutter sites for them. These days a tiny company with a great site can give the giants a real run for their money.

It's pioneer time all over again: *WWW* could stand for the *Wild, Wild West.* Back in the dusty frontier era, being rich and powerful went only so far. Owning half the territory didn't mean much if you had to face down a penniless half-pint with a fast draw. Then the Colt .45 was the **GREAT EQUALIZER.** Now it's a flair for HTML and Java.

Your small business may not have the brand recognition of a Fortune 500 competitor, but if your site puts theirs to shame and you're both offering similar products, you'll end up **ON EVERYONE'S HOTLIST** while the sleepy corporate page remains hitless. Until the big guys figure this out, startups and upstarts have an incredible opportunity to cash in.

(Digital equality is also the case with **ONLINE CHAT IDENTITIES.** In the real world, many people react to differences in race, gender, sexual preference, age, accent, height, weight, dress, handicaps, and overall attractiveness. On the Internet, these distinctions vanish. As the words squirt across the screen, all that's important are the quality of your responses, your spelling, and your typing speed.)

This won't go on forever. Right now, half the corporate sites are probably put up just so some technogroupie CEO can **BOAST AT A COCKTAIL PARTY** that he's wired. Companies will eventually hire real Web wizards and throw real money at the problem. Instead of looking like mom-and-pop bodegas, their Web presences may become vast, sophisticated, resource-rich superstores that little guys simply can't match.

And level chat playing fields will tilt as well. As Bill Gates points out in *The Road Ahead*, as soon as the bandwidth can handle it, we'll all be using video everywhere. Then we can once again make prejudicial surface judgments—it'll be just like old times.

But until then, while the Internet is still new and **HOTTER THAN MCDONALD'S COFFEE**, smart small companies can take advantage of this equal time and get some real traction for the future.

PHOTOGRAPH BY JAMES McGOON

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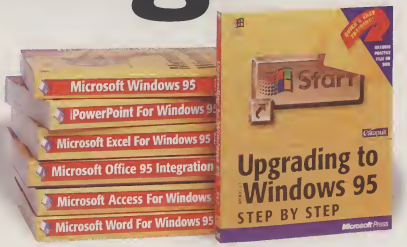

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Designed for Microsoft® Windows® 95

John C. Dvorak

Web, Schmeb

When will we come to our senses? The World Wide Web is inefficient and overhyped. I'm sick of it. I use the Web once in a while, usually to find something obscure. I tend to use the Lycos search engine and plow through hits reading each description to see if what I'm looking for might be on a particular site. It's a time-consuming process, mostly consumed by the Internet itself as I wait during the "contacting site" lag.

I find these lengthy delays amusing, since everyone seems to think that T1 connections will make them go away. The "contacting site" delay has nothing to do with transmission speed.

I observed this years ago when advanced, Net-savvy Macintosh users were trying the first versions of Mosaic. Despite direct links to the Internet and low usage rates, there was a noticeable "contacting site" delay. Too often the site is never contacted, so you have to reload the address and try again. None of this has changed, even with mirror sites and cached sites.

Then there is the quality issue. Far too many sites are poorly maintained—or don't work at all. A local PBS television station keeps advertising how cool it is by posting its Web address. I spent nearly an hour simply trying to get the daily program listing. Instead of retrieving that, I was rerouted to the menu page over and over. After an hour of frustration, the program page finally appeared. But clicking on some innocuous hyperlink threw me back to the menu page, where I was locked out again.

Another example of phenomenally bad page design shows up time and again in various classified ad sites. I spent an hour posting a simple notice on a site specializing in car sales. It should have taken one form, with one click. But no, it was Web page after Web page cycling back and forth with confirmation pages and time wasted "contacting site." A simple five-minute phone call to the local newspaper classifieds would have been much more efficient.

The problem is media boosterism and lack of critical analysis, which have not only let this joke run rampant, but also set the stock market for Internet-related issues on fire. The World Wide Web does have a use, and its simple architecture does open the door for new ways of communicating. But have we completely lost our minds regarding its incredible inefficiency and the fact that 95 percent of the pages served up on the Web are useless garbage?

Wired magazine is the root of all this evil. Its hipcat, golly-gee-whiz blather is the worst kind of boosterism. *Wired* is a fluff magazine whose uncritical pro-Net hype is largely responsible for triggering Internet mania. *Wired* has also fed the freebie frenzy whereby hordes of Internet junkies and would-be socialists spew the malarkey that all information should be free. Yeah, any excuse not to pay writers.

UNCRITICAL *media boosterism set the* **STOCK MARKET** *on fire. It's as if the* **WEB** *were modeled after a* **PYRAMID SCHEME.** *Its proper place is next to the* **YELLOW PAGES,** *not the Bible.*

Recently the general computer press, this magazine included, has one-upped *Wired* and jumped on the same ragged bandwagon headed for the same gaga pit of promotion. Everyone has set up a Web site, and every magazine and Web site has its list of favorite other Web sites. "Top 100" sites are just plain stupid. Many of the favorite Web sites are nothing more than lists of other sites. It's as if the entire Web were modeled after a pyramid scheme or a chain letter. Saying Yahoo or Lycos is your favorite site is like saying the Yellow Pages is your favorite book. Does anyone see the insanity in all this?

The hollowness of this entire phenomenon is what bothers me the most. Even the so-called most interesting sites are mostly useless. If you really need substance you must go to an online service or BBS where you can interact in real time. Some Web sites claim to do this, but they're rare and mimic a BBS or have a BBS back end.

Anyway, I was looking for some drivers for a Toshiba CD-ROM, and any experienced user knows one of the best uses for a modem is to call a vendor BBS and download new or lost drivers. The Web is mostly useless for this. Most Web sites have limited downloading capability. When you need drivers, it's hard to download or get to the right page—or the guy who maintains the drivers keeps them on the BBS for people who know what they're doing. But I didn't have a BBS number, so I looked up *Toshiba* and *drivers* on the Alta Vista search site and found a Toshiba Web site. No drivers were there, but there was the number of the Toshiba BBS. *Aha!* The Web scores a point by finding me a BBS number!

The Web will have its place in the world of information and communication. But let's stop listening to newbies and drooling know-nothings and put the Web in its proper place—right next to the Yellow Pages, not next to the Holy Bible.

PHOTOGRAPH BY JAMES McGOON

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MILLENNIA P150

- Intel 150MHz Pentium processor
- 256K pipelined burst cache, flash BIOS
- 6X EIDE CD-ROM drive, 3.5" floppy drive
- SoundBlaster™ 16 stereo sound & speakers
- PCI 64-bit video, MPEG, 2MB EDO
- *Tool-free* mini-tower or desktop
- Microsoft® Mouse, 104-key keyboard
- Microsoft Windows® 95 CD
- 5-year/3-year Micron Power℠ warranty*

A • 8MB EDO RAM • 850MB EIDE hard drive • 15" Micron 15FGx, .28dp (13.7" display) • Microsoft Works 95 CD
$2,299 Business lease $82/month

B • 16MB EDO RAM • 1.2GB EIDE hard drive • 15" Micron 15FGx, .28dp (13.7" display) • Microsoft Office Pro 95 & Bookshelf 95 CDs
$2,699 Business lease $96/month

C • 32MB EDO RAM • 1.6GB EIDE hard drive • 17" Micron 17FGx, .26dp (15.8" display) • Microsoft Office Pro 95 & Bookshelf 95 CDs
$3,599 Business lease $123/month

• With 166MHz Pentium processor.....add $200

"The Millennia is nothing short of the best all-around PC available on the Market today."
PC Magazine, April 25, 1995

PC MAGAZINE EDITORS' CHOICE

According to *PC Magazine*'s recent Windows-based tests, the Micron P120 Millennia is a "star performer." The Millennia garnered the highest Graphics WinMark score ever seen, in addition to a top-notch Winstone score.

intel inside pentium

MILLENNIA PLUS P166

- Intel 166MHz Pentium processor
- 256K pipelined burst cache, flash BIOS
- PCI 32-bit Ultra SCSI Fast-20 controller
- 6X SCSI-2 CD-ROM drive, 3.5" floppy drive
- SoundBlaster 16 stereo sound & speakers
- PCI 64-bit video, MPEG, 2MB EDO
- *Tool-free* mini-tower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 CD
- Microsoft Office Pro 95 & Bookshelf 95 CDs
- 5-year/3-year Micron Power℠ warranty*

A • 16MB EDO RAM • 1GB Fast SCSI-2 hard drive • 15" Micron 15FGx, .28dp (13.7" display)
$3,299 Business lease $112/month

B • 32MB EDO RAM • 2GB Fast SCSI-2 hard drive • 15" Micron 15FGx, .28dp (13.7" display)
$4,199 Business lease $143/month

C • 64MB EDO RAM • 4GB Fast SCSI-2 hard drive • 17" Micron 17FGx, .26dp (15.8" display)
$6,099 Business lease $199/month

• With 150MHz Pentium processor.....subtract $200

HOME MPC P100

- Intel 100MHz Pentium® processor
- 8MB EDO RAM • 850MB EIDE hard drive
- 4X EIDE CD-ROM drive, 3.5" floppy drive
- SoundBlaster™ 16 stereo sound & speakers
- 14.4 fax/modem, speakerphone, voice mail
- PCI 64-bit video, MPEG, 2MB EDO
- 15" Micron 15FGx, .28dp (13.7" display)
- *Tool-free* mini-tower or desktop
- Microsoft® Mouse, 104-key keyboard
- Microsoft Windows® 95 CD
- Microsoft Works 95 CD
- Microsoft Scenes: Sports Extremes; Microsoft 8ob™ CD; Microsoft Encarta CD; Quicken® Deluxe Edition CD; Microsoft Dangerous Creatures CD; Microsoft Golf Multimedia CD; Trial subscriptions for Compuserve™, Prodigy™ and America On-Line™.
- 5-year/3-year Micron Power warranty*

$1,999

May 16 1996 How: MPC P90 — July 1995 How: MPC P90 — September 1995 How: MPC P90

HOME PRO MPC P150

- Intel 150MHz Pentium processor
- 256K pipelined burst cache, flash BIOS
- 16MB EDO RAM • 1.2GB EIDE hard drive
- 6X EIDE CD-ROM drive, 3.5" floppy drive
- SoundBlaster 16 stereo sound & speakers
- 28.8 fax/modem, speakerphone, voice mail
- PCI 64-bit video, MPEG, 2MB EDO
- 17" Micron 17FGx, .26dp (15.8" display)
- *Tool-free* mini-tower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 CD
- Microsoft Office Pro 95 & Bookshelf 95 CDs
- Microsoft Scenes: Sports Extremes; Microsoft 8ob CD; Microsoft Encarta CD; Quicken Deluxe Edition CD; Microsoft Dangerous Creatures CD; Microsoft Golf Multimedia CD; Trial subscriptions for Compuserve, Prodigy and America On-Line.
- 5-year/3-year Micron Power warranty*

$3,199

- With 133MHz Pentium processor.....subtract $100
- With 166MHz Pentium processor.....add $200

POWERSTATION P100

- Intel 100MHz Pentium processor
- 4X EIDE CD-ROM drive, 3.5" floppy drive
- SoundBlaster 16 stereo sound & speakers
- PCI 64-bit video, MPEG, 2MB EDO
- *Tool-free* mini-tower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 CD
- 5-year/3-year Micron Power warranty*

A • 8MB EDO RAM • 850MB EIDE hard drive
• 15" Micron 15FGx, .28dp (13.7" display)
• Microsoft Works 95 CD
$1,899 Business lease $68/month

B • 16MB EDO RAM • 1.2GB EIDE hard drive
• 15" Micron 15FGx, .28dp (13.7" display)
• Microsoft Office Pro 95 & Bookshelf 95 CDs
$2,299 Business lease $82/month

- With 133MHz Pentium processor.....add $100

June 25, 1994 PowerStation P90 — May 1995 PowerStation P90

MAGNUM PRO180

NEW

- Intel 180MHz Pentium Pro processor
- 256K internal cache, flash BIOS
- 6X SCSI-2 CD-ROM drive, 3.5" floppy drive
- SoundBlaster 16 stereo sound & speakers
- PCI 64-bit video, MPEG, 2MB EDO
- *Tool-free* mini-tower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows NT Workstation 3.51 CD
- Microsoft Office Pro 95 & Bookshelf 95 CDs
- 5-year/3-year Micron Power warranty*

A • 16MB RAM • 1.2GB EIDE hard drive
• 15" Micron 15FGx, .28dp (13.7" display)
$3,999 Business lease $136/month

B • 32MB RAM • 1.6GB EIDE hard drive
• 17" Micron 17FGx, .26dp (15.8" display)
$4,899 Business lease $167/month

- With 150MHz Pentium Pro processor....subtract $200
- With 200MHz Pentium Pro processor.....add $200

MAGNUM PLUS PRO200

NEW

- Intel 200MHz Pentium Pro processor
- 256K internal cache, flash BIOS
- PCI 32-bit Ultra SCSI Fast-20 controller
- 6X SCSI-2 CD-ROM drive, 3.5" floppy drive
- SoundBlaster 16 stereo sound & speakers
- PCI 64-bit video, MPEG, 2MB EDO
- *Tool-free* mini-tower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows NT Workstation 3.51 CD
- Microsoft Office Pro 95 & Bookshelf 95 CDs
- 5-year/3-year Micron Power warranty*

A • 32MB RAM • 2GB Fast SCSI-2 hard drive
• 15" Micron 15FGx, .28dp (13.7" display)
$5,199 Business lease $170/month

B • 64MB RAM • 4GB Fast SCSI-2 hard drive
• 17" Micron 17FGx, .26dp (15.8" display)
$7,099 Business lease $232/month

C • 128MB RAM • 9GB Fast SCSI-2 hard drive
• 21" Micron 21FGx, .28dp (20.0" display)
$11,799 Business lease $379/month

POWERSERVER SMP P133

- Intel 133MHz Pentium processor
- Dual Pentium SMP ZIF sockets
- 512K write-back cache, flash BIOS
- Slots: 5 EISA, 2 PCI, 1 EISA/PCI
- PCI 32-bit Ultra SCSI fast-20 controller
- 4X SCSI-2 CD-ROM drive, 3.5" floppy drive
- PCI 64-bit video, MPEG, 2MB EDO
- Full-size tower with 10 drive bays
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 CD
- 5-year/3-year Micron Power warranty*

A • 16MB RAM • 1GB SCSI-2 hard drive
• 15" Micron 15FGx, .28dp (13.7" display)
$3,199 Business lease $109/month

B • 32MB RAM • 2GB SCSI-2 hard drive
• 15" Micron 15FGx, .28dp (13.7" display)
$4,099 Business lease $139/month

- With second 133MHz Pentium processor...add $799
- With Windows NT Workstation 3.51 CD....add $249

PowerServer SMP P133

*MICRON POWER™ WARRANTY & SUPPORT

- 5-year limited warranty on microprocessor and main memory
- 3-year limited parts-only system warranty
- 1-year optional on-site service agreement included
- 30 days of free Micron-supplied software support
- 30 day money-back policy
- 24-hour technical support

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Circle 106 on reader service card.

New! Lotus Notes Release 4

Groupware on a Grand Scale

SNEAK PREVIEW

If your company is committed to distributing information across huge networks, you're probably already using Lotus's Notes—and grumbling about it. The interface is awkward, the development environment antiquated, and support for a Notes setup requires a small army of technicians. So why use it? Because despite its flaws, nothing else does what Notes does: combine distributed databases with powerful communications, replication, and security layers—all tailor-made for far-flung corporations.

The latest upgrade to Notes, Release 4, is a top-to-bottom rewrite that tackles all those complaints. After looking at a beta release of the new Notes client for Windows 95, we were impressed with the way the rough edges have been smoothed over. The new interface has a crisp, clean look that borrows heavily from the usability innovations in Lotus's SmartSuite applications. Under the surface, Lotus has tuned the engine to eliminate some annoying performance bottlenecks. And the graceless mail system has been completely overhauled and replaced with the elegant cc:Mail interface.

Pane Relief The most noticeable improvement is the new document browser, which received interface inspiration from Microsoft's Windows 95 Explorer. Where earlier versions required users to double-click on each database to see its contents, Notes 4 users can quickly navigate through databases using side-by-side panes: a hierarchical tree containing folders and views on the left, and an active view window on the right. There's also an optional third pane that previews selected documents.

Windows 95 users will feel right at home. Right-clicking on most objects uncovers their properties in an InfoBox. Menus and icon bars follow GUI conventions and are context-sensitive.

The Notes 4 text editor does everything you'd expect from a competent word processor, unlike its underpowered predecessor. And if you can't figure out how something works, you can look it up in the much-improved Help system.

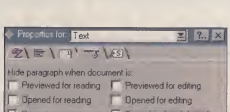
Performance Pluses With Notes 4, the Windows 95 client has been reworked to take advantage of the 32-bit, multithreading features of the operating system. In our beta version, loading the client took noticeably longer, but other operations, such as opening up documents and switching views, felt zippier.

We didn't test the server version, but Lotus has added multiprocessor support, which means there will be fewer waits even in heavy network traffic. Administrators and users alike grumbled about sluggish data-transfer rates when exchanging replicas of Notes databases under previous versions. The problem? Changing even a single character in a document caused Notes to replace the entire document. With Notes 4, only the changed fields are replicated, saving hours of online time when dealing with large documents.

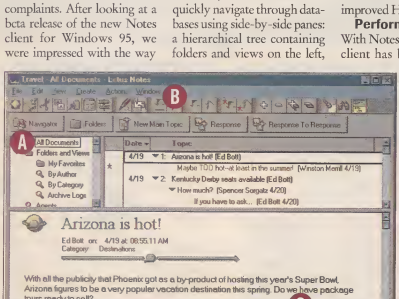
For mobile users dialing into multiple Notes servers, a new feature called Pass-Through Replication eliminates a frustrating usability hassle. Instead of dialing into multiple servers, remote users can dial into a single server and let it update all the local files in one smooth operation using the network backbone.

Development Tools For most businesses, the lifeblood of Notes is its custom applications. With Release 4, Notes developers get a transfusion of new programming tools that should dramatically boost the power and cut the development time for each project.

At the simplest level, developers can incorporate subforms and collapsible regions into their designs to keep



Quick Switch: View and change formats and other object properties with Lotus-standard InfoBoxes.



New Views: The default browser for Notes 4 databases includes an Explorer-style tree pane and view pane. Databases can include messages, threaded discussions, or file libraries.

A. Click on the **Navigator** button to replace text-oriented lists with a Web-like image map.

B. Menus and icon bars (pop-up help included) follow Lotus's SmartSuite conventions.

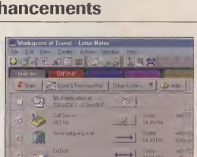
C. Mobile users can define locations (home, office, hotel) to make **dial-up access** simpler.

Guide to PC Computing's Ratings

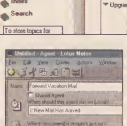
Excellent *Market leader that offers exceptional performance* ..... ★★★★★
Good *Excels in many areas; a good buy* ..... ★★★★
Acceptable *Average for its class; a justifiable purchase* ..... ★★★
Poor *Out of date or substandard; offset by some positive features* ..... ★★
Unacceptable *Missing necessary features; avoid* ..... ★

GUIDED TOUR Lotus's Notable Enhancements

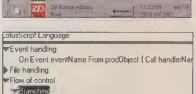
Selective Sort: The familiar folder and file metaphor makes it easy to organize documents by category.



Custom Updates: Replicator checkboxes let Notes users synchronize database copies with a few clicks.



Smart Filters: Point-and-click agents automatically handle documents in a database, letting you weed out anything you don't want, and prioritize everything you do.



LotusScript: The Visual Basic–compatible Notes language, LotusScript, provides extra programming muscle to agents.

information-packed forms from appearing cluttered. Developers may choose to hook data displays and actions to maps and other graphical objects, instead of using standard forms.

Professional developers also have access to LotusScript, an object-oriented, cross-platform scripting language that's compatible with Microsoft's Visual Basic for Applications. And hooking Notes databases to other applications is no problem, because Notes supports seamless data transfer using both Microsoft's OLE 2.0 and Lotus's Notes F/X 2.0.

End users can take a crack at programming with the help of point-and-click agents. On local replicas of Notes databases, for example, an agent might automatically remove old documents after a preset interval. Agents can even trigger a series of actions, such as monitoring your mail while you're away on vacation, automatically forwarding each incoming message to a coworker, and notifying the sender that you're away.

New Security Blankets

Notes 4 is packed with features that have been at the top of every Notes administrator's wish list for years. Our favorite is the Administration Control Panel for managing security settings across multiple servers. Beefed-up security options include encryption for local database copies and a document option that lets you disable printing and copying.

The InterNotes Web Navigator, a built-in Mosaic-style browser, lets users view World Wide Web pages without leaving Notes. Developers can incorporate URLs into Notes documents and let anyone with a TCP/IP connection log in and read Notes information.

What's not to like? Notes 4 is too complex and expensive for small or even midsize businesses. Despite the welcome usability improvements, it requires a hefty investment in infrastructure and a dedicated support staff. But if you can afford it, it's the only choice for wide-scale information sharing. Other big software developers are frantically working on Notes alternatives, but its two closest rivals, Microsoft's Exchange and Netscape's Collabra Share, still can't match the power of Notes. ED BOTT

FILEBOX

Notes Release 4

Technology ★★★★★
Verdict ★★★★

For wide-scale information sharing, nothing matches Notes' power.

Competition: Microsoft's Exchange and Netscape's Collabra Share offer some group features, but neither comes close to the groupware features and power of Notes. Notes also offers more levels of development and expansion, including World Wide Web–page viewing and publishing, and third-party utilities.

$55 to $275 est. street price per client, depending on features and type of client purchased
Lotus Development Corp.
(800) 346-1305, (617) 577-8500
Reader Service No. 671

The essential accelerators

Only MGA Millennium can get you through an entire day of graphics!

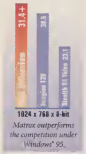
As a serious graphics user, you'll need the acceleration power of MGA Millennium to boost the performance of your demanding Windows® 95 and DOS based graphics applications.

MGA Millennium uses the industry's most advanced graphics technology to provide an all-in-one solution for accelerating true color, video, 3D and games. And for only $339! (ESP*)

Featuring the award-winning MGA 64-bit graphics processor, new Window RAM memory, and an optimized PCI bus design, MGA Millennium delivers consistently high performance in all resolutions, color depths and refresh rates.

And because MGA Millennium integrates all of this acceleration into a single hardware design, you'll be ready for today's and tomorrow's demanding Windows 95 applications. You'll be able to display true 24-bit color documents at resolutions up to 1600 x 1200, play back full screen MPEG and AVI video clips, and render 3D presentations and designs in real-time.

Combine MGA Millennium with its video upgrades and you'll even be able to capture still video frames from a VCR, laser disk or camcorder, watch full screen MPEG video at 30 frames per second, and view T.V. right on your PC.



Matrox outperforms the competition under Windows® 95.

So boost your graphics performance with MGA Millennium. It's the only accelerator powerful enough to get you through your demanding graphics applications. Starting at only $339*.

- True color, video, 3D and game accelerator
- 2 or 4 MB PCI base boards
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- Free! Papyrus NASCAR® Racing, Asymetrix® 3D F/X™, and Compcore SoftPEG™ MPEG player, and much more (retail version only)
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* Estimated street / selling price for the 2MB version Windows 95 tests conducted by Matrox Graphics Inc. using ZiFF Davis' Winbench 96 on a Gateway P5-133 MHz system with 256k cache. IBM 850 RAM at 1024 x 768 in 256 colors / 72 Hz large fonts / The Matrox MGA Millennium and Diamond Stealth 64 Video were were configured with 2 MB of memory, and the Number Nine Imagine 128 was configured with 4 MB of memory, for the PCI bus using clover releases 2.70 / 4.1 and / 04 respectively

Circle 154 on reader service card.

New! HARDWARE: Toshiba Tecra 700CT · Lexmark Optra C · Compaq Deskpro XL 6150 · Acer Aspire · Canon InnovaBook 350CD vs. Canon NoteJet IIIcx · Telephony Sound Cards

Palm Computing Pilot 1000

Portable Pocket Assistant

SNEAK PREVIEW

If you're like most professionals, your office is more like an airport than a workspace: You're constantly coming and going, off to meetings, away on business trips, back to your desktop, and then off again. But most PDAs and organizers make it too difficult (and expensive) to synchronize and access critical data.

Palm Computing's Pilot 1000, a new pocket-size organizer, can help. For only $299, the Pilot 1000 lets you access your calendar, contact addresses, and notes. Plus you can connect and synchronize with your desktop in a flash.

Truly Pocket-Size The compact Pilot really does fit in your shirt pocket (it's just slightly larger, but thinner, than a deck of cards). Buttons for controlling power, scrolling, and built-in applications are easy to access from the front of the unit. The Pilot 1000 also runs an efficient, 32K operating system called the Palm Connected Operating System. It includes three components: the Pilot Connected Organizer; Pilot Desktop software for Windows; and the Pilot Cradle serial port, which connects the Pilot to your PC.

Want to take notes? An onboard stylus pops out for quick pen input using Palm's unique Graffiti technology, which recognizes simple pen strokes. It takes a while to get comfortable with Graffiti, but in a few hours we were quickly and accurately taking notes in the writing area (the bottom third of the screen), which is split into two panes: one for text entry, the other for numeric entry. You can also enter information by tapping directly on the onscreen keyboard. The display is not backlit, but it's easy to read.

Pilot Desktop, which we tested under Windows 95, includes four basic applications: Date Book, Address Book, To Do List, and Memo Pad. These same four applets are built into the Pilot Connected Organizer. Pilot Desktop acts as a gateway between Pilot and other applications on your PC, and lets you import basic text and database file formats. The idea is to enter appointments, addresses, and notes via your PC using Pilot Desktop, or directly into the Pilot Connected Organizer using Graffiti. The Pilot Cradle, in turn, is the synchronization port that connects the Pilot Connected Organizer to the Pilot Desktop. Best of all, synchronizing the two is as easy as pushing the Pilot Cradle's HotSync button.

Getting Even Better Palm Computing sells a serial cable that lets you attach a common modem to the Pilot, but you should watch for a separate, attachable 14.4Kbps modem from U.S. Robotics (Palm Computing's parent company). Likewise, wait for all the major personal information management developers, such as Now Software, to build Pilot conduits.

As is, the Pilot 1000 is an outstanding product: It's fast, easy to use, and inexpensive. And with those communications add-ons, it promises to get even better. If you're searching for the ultimate palm-size organizer, look no further. **RICH SCHWERIN**

In Hand: Palm Computing's new Pilot 1000 is the easiest way to keep mission-critical information—appointments, contacts, and notes—in hand and in sync. It's push-button simple to synchronize between the Pilot 1000 and your desktop system.

PHOTOGRAPHS BY ARNOLD TIGBELIO

FILEBOX

Pilot 1000

Usability	★★★★★
Technology	★★★★★
Verdict	★★★★★

The ultimate palm-size organizer at a bargain price.

Competition: Similar organizers, including Sharp's Zaurus and Hewlett-Packard's OmniGo 100 and LX line, are bigger, more expensive, and require separate cable and software-connectivity packs. High-end PDAs like Apple's Newton MessagePad 120 and Sony's Magic Link PIC-2000 offer better communication features but cost hundreds of dollars more.

Size: 4.6 by 3.1 by 0.6 inches.

Weight: 5.5 ounces.

Power: Two AAA batteries deliver between 8 and 12 weeks of battery life.

Display: Nonbacklit screen.

$299 est. street price
Palm Computing
(800) 881-7256,
(415) 948-9560
Reader Service No. 672

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Top-Tier Multimedia for the Road

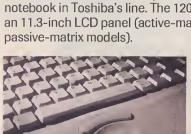
Once in a while a simple upgrade ushers in so much new technology that companies have to create a whole new product line around it. So it is with Toshiba's new top-of-the-line Tecra 700CT.

Not only is this system Toshiba's first stab at a high-end multimedia portable, but the 120MHz Pentium-based machine also features both an internal and external 32-bit PCI bus. Because this makes the notebook incompatible with the company's current line of docking stations, Toshiba concurrently introduced the $780 Desk Station V, which accommodates both PCI and ISA cards and comes with built-in SCSI-2.

Wide Angle New to Toshiba portables is the Tecra 700CT's 11.3-inch active-matrix display (the 700CS uses an 11.3-inch dual-scan passive-matrix panel). Backed by Chips & Technologies' 65548 video accelerator, both panels can display 800-by-600-pixel resolutions with up to 256 colors—or 1,024 by 768 resolution on an external monitor. Brightness and color quality are resplendent. The active-matrix model is an ideal platform for traveling business presentations before audiences of as many as three.

As with others in the panoply of multimedia notebooks, the Tecra's floppy drive swaps out with an optional $334 quad-speed CD-ROM drive. Unlike most notebooks, the floppy can also attach via cable to an external port so you can use the CD-ROM drive and disk drive simultaneously. Unlike IBM's ThinkPad 760CD, Compaq's LTE 5000, and NEC Technologies' Versa 4000C, however, you can't alternately use this drive bay for a second battery or a second hard drive.

Business Class: The Tecra 700CT supplants the Satellite Pro 400CDT as the premier multimedia notebook in Toshiba's line. The 120MHz Tecra has an 11.3-inch LCD panel (active-matrix or dual-scan, passive-matrix models).



Wrist Relief: Even with dual stereo speakers, the Tecra's keyboard still accommodates Toshiba's trademark wrist rest.

Then again, you may not need to. The machine comes standard with a 1.13GB hard drive—and yes, it's removable. With two drives, you can keep applications and data files on one and your multimedia presentations on another. Why bother with the slow access times of a CD-ROM? Also, the lithium-ion battery is considerably larger than what's in other notebooks. Battery life in our tests was over five hours.

Listen Up Dual speakers replace the single speaker found on Toshiba's previous multimedia machine, the Satellite Pro 400CDT. As a result, sound quality is vastly improved.

Although the speakers take up keyboard space, the Tecra 700CT keeps Toshiba's trademark of usability: an expansive wrist rest with dual mushroom-cap mouse buttons that accompany the pointing stick. Typing doesn't get any more comfortable than this. Gone, however, is the system-status display. Instead, there are LCD lights, four of which are oddly mounted on the front of the unit, completely out of sight.

This is a forgivable trade-off considering the machine's otherwise excellent usability. Mind you, it's big and heavy: 9.1 by 11.8 by 2.3 inches and 7.3 pounds. But so is every other multimedia portable on the market. For the weight, no feature was spared. Besides standard PC Card slots and a full complement of audio and expansion ports, there's an infrared port as well as an integrated microphone.

And as you'd expect, the case, port covers, and general construction are up to Toshiba snuff. With the standard 16MB of synchronous dynamic RAM and a 1.13GB hard drive, plus the optional quad-speed CD-ROM drive, the Tecra 700CT costs $6,333. Is it worth it? Although the Tecra lacks the modularity of other portables, its fast performance, long battery life, and gorgeous display give IBM's ThinkPad 760CD and Compaq's LTE 5000 a run for the money. **MARTY JEROME**

FILEBOX

Tecra 700CT

Usability	****
Performance	*****
Technology	****
Verdict	****

If performance counts and price doesn't, this is the multimedia portable to get.

Competition: The Tecra isn't as versatile as other portables in this class, such as IBM's ThinkPad 760CD and NEC's Versa 4000, but it offers faster performance and a longer battery life.

Features as Tested: 120MHz Pentium, 16MB of synchronous DRAM, 1.13GB removable hard drive, optional removable quad-speed CD-ROM drive, two Type II PC Card slots, 16-bit audio, dual speakers, 11.3-inch high-resolution active-matrix display, lithium-ion battery, infrared port.

$5,999 est. street price; $6,333 with quad-speed CD-ROM drive
Toshiba America
(800) 999-4273, (714) 583-3000
Reader Service No. 673

PHOTOGRAPHS BY ARNOLD TOSKEJO

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

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Circle 376 on reader service card.

Lightning-Fast Laser Color

With all of the new color laser printers on the market, it's a wonder every office doesn't have at least three—until you consider the hefty price tags on most laser printers, that is. Trying to find the perfect balance, Lexmark presents the Optra C, a top-notch printer with a very competitive price.

The $6,400 Optra C gives you a lot for your money, including the fastest laser performance we've seen. You'll also find 600-dpi output, PostScript Level 2, and PCL5 with color emulations. While the Optra C ships with two internal network-adapter slots, you'll have to shell out extra bucks for an Ethernet or TCP/IP network adapter.

Fast and Furious While the Optra C's color output isn't as crisp as that of Apple's Color LaserWriter 12/600 PS, its speed was amazing, soaring above everything in its price range. When printing a short 3-page presentation, the Optra C was approximately 250 percent faster than the Color LaserWriter, and over 130 percent faster than Xerox's XPrint 4920 (see "First-class Color, Lavish Price," February, page 74).

For basic text documents, the Optra C nabbed the top spot once again, printing more than 100 percent faster than the Color LaserWriter and about 20 percent faster than the XPrint 4920. On our 4-page newsletter test of mixed text and graphics, however, the Optra C printed 40 percent slower than the Color LaserWriter.

Although the Optra C is equipped with the same engine as the Color LaserWriter, the printers differ more than you'd expect. Lexmark's MarkVision control system is far superior, letting you control the printer through either the software or the printer's front panel. The software provides a graphical duplication of the printer's front panel, showing info like error messages and menu commands. It's rich in features, giving you options for printer and driver setup, diagnostics, output, and notifications.

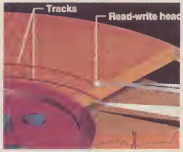
The interface is one of the best we've evaluated. And it provides benefits not only for anyone on the network, but for the network administrator as well. It takes the guesswork out of managing remote printers because you can access all the necessary information—from the printer's configuration to error messages such as "out of paper"—through the Optra C's software.

Looks Good on Paper While the Optra C didn't produce the highest-quality output, it was still among the best. In default mode, heavily layered surfaces such as presentation graphics were blotchy. In addition, we noticed some dithering that detracted from detailed images. The Optra C performed considerably better than the Color LaserWriter when printing fine black lines, but for text output we preferred the Color LaserWriter. The Optra C's toner splattered, creating a slightly fuzzy text effect.

The Optra C holds its own against the competition. Xerox's XPrint 4920 color laser is a pricey alternative without any extras, while QMS's magicolor CX/20 also costs considerably more. Apple's $6,550 Color LaserWriter 12/600 PS outdoes the Optra C in color-output quality, however, and offers networking features that the Optra C lacks. Second-generation products due out this summer from Tektronix and Hewlett-Packard, as well as a new product from Digital Equipment, will raise the stakes even higher.

Lexmark's Optra C is a welcome addition to the competitive field of color laser printers. While it isn't the cheapest and the output isn't the best, it's still a quick and solid printer at a reasonable price. KYLA K. CARLSON

Speedy Hues: Lexmark's Optra C color laser printer offers solid 600-dpi output and the fastest print speeds we've seen on any color laser to date.



Color-Coordinated: The Optra C produces rich colors and sharp lines. Still, it doesn't match the sharp and vivid output of Apple's Color LaserWriter.

FILEBOX

Optra C

Usability	****
Performance	****
Technology	****
Verdict	****

The fastest color laser printer you can buy today.

Competition: Apple's Color LaserWriter 12/600 PS costs about $150 more than Lexmark's Optra C, but the Color LaserWriter ships with Ethernet and TCP/IP support. These options cost $369 and $299 respectively with the Optra C.

Features as Tested: Adobe PostScript Level 2, enhanced PCL5 with color emulations, 8MB of RAM (expandable to 64MB), 12 ppm (black-and-white), 3 ppm (color).

Resolution: 600 by 600 dpi.

Cost per Page: 4 cents for black-and-white, 17 cents for color.

$6,400 est. street price
Lexmark Int'l
(800) 891-0331, (606) 232-2000
Reader Service No. 674

PHOTOGRAPHS BY ARNOLD TOSELIO

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

Has lived in New York all his life.
Never visited the Empire State Building.

Top-of-the-Line Deskpro

People who just tap out e-mail or tweak spreadsheets have it easy. Fast Pentium systems abound. But in high-end business computing—where PCs are expensive and the technology teems with mystery—you sweat when it's time to buy. Compaq's new Deskpro XL 6150 may very well change all that.

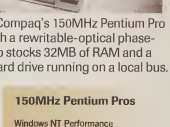
Our early look at the 150MHz Pentium Pro–based DeskPro XL 6150 confirms that it will assume a rightful place as Compaq's flagship desktop system. It brings together one of the best-construed packages you'll find. Whether you use it for financial analysis, engineering, graphic design, or multimedia authoring, it delivers solid, if unspectacular, Windows NT performance and a wide range of features.

Read and Write The Deskpro XL 6150 stands out from the pack of first-generation Pentium Pros for several reasons. For one, it comes with an internal quad-speed phase-dual–CD drive—the first to enter our labs. The drive can read conventional CDs as quad-speed drives do, or can be used to write up to 650MB of data to a rewritable-optical cartridge. With that kind of capacity and backup, who needs the slower tape-drive solution?

The Deskpro XL 6150 is also the first Pentium Pro we've seen to run its hard drive on a Fast SCSI-2 interface connected to a 32-bit PCI local bus. Other makers offer SCSI as an option. An Enhanced IDE connector is also included, should you want it for additional peripherals. A 32-bit Ethernet connector running on a local bus is integrated as well. This leaves all but one of its five slots (one PCI, three EISA, one PCI/EISA) free.

Compaq's Finest: Compaq's 150MHz Pentium Pro is the first to ship with a rewritable-optical phase-dual–CD drive. It also stocks 32MB of RAM and a 2.1GB Fast SCSI-2 hard drive running on a local bus.

Slow but Sure: Although it's 55 percent faster than a 133MHz Pentium, the Deskpro XL 6150 lags significantly behind other 150MHz Pentium Pros in its class.



Meanwhile, the Deskpro XL 6150 doesn't skimp on meat and potatoes. The model we tested came with 32MB of speedy dual-inline memory modules, expandable to 512MB. You can increase the 2.1GB of storage (standard on the Model 2100, which we tested) to 4GB. And in a switch for Compaq, which traditionally uses its own graphic adapters, the machine features Matrox's ultrafast MGA Millennium video card with 2MB of Window RAM. It can render 256 colors at 1,600 by 1,200 resolution.

The Payoff As Windows NT performance goes, the Deskpro XL 6150 certainly can't compete with Dell's stunning 200MHz Dimension XPS Pro 200. For that matter it lagged substantially behind Hewlett-Packard's Vectra XU 6/150 and NEC's PowerMate Pro150—both of which run at the same clock speed as the Deskpro and use the same video card (see "Desktop Supersystems," page 132).

But you could hardly call the Compaq a laggard. And in the heavy transaction processing typical in page-layout and engineering applications, the faster transfer rates of the SCSI drive could actually give the Deskpro XL 6150 a performance advantage. Speed will vary depending on your applications, of course, and all Pentium Pros are best suited to 32-bit applications (Microsoft's Windows NT Workstation is bundled as standard equipment). As with all Pentium Pro systems, Windows 95 performance lags well behind what you'll get from a plain 150MHz Pentium system.

The price tag for this resplendent technology isn't for the faint hearted: $6,499—and that's without a monitor. If you're willing to whittle down memory to a paltry 16MB, make do with a stingy 1GB hard drive, and settle for a simple quad-speed CD-ROM drive (no phase-dual), the price dips to a less painful $4,999. However, if you're serious about high-end power and top-notch components, you would only be cheating yourself. MARTY JEROME

FILEBOX

Deskpro XL 6150

Usability	****
Performance	***
Technology	*****
Verdict	****

A no-regrets Pentium Pro for NT—if you have the cash.

Competition: Both Hewlett-Packard's Vectra XU 6/150 and NEC's PowerMate Pro150 outperformed the Deskpro XL 6150 in our tests. However, the Deskpro's SCSI drive will yield the best results in many data-intensive applications.

Features as Tested: 150MHz Pentium Pro; 32MB of RAM, 2.1GB Fast SCSI-2 hard drive, quad-speed rewritable phase-dual–CD drive, Matrox's MGA Millennium video accelerator with 2MB of Window RAM, 16-bit audio, stereo speakers integrated on the keyboard.

$6,499 est. street price (monitor not included)
Compaq Computer Corp.
(800) 345-1518
Reader Service No. 675

PHOTOGRAPH BY ARNOLD TIERSLIO

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

Was born and raised in Paris.
Has never been to the top of the Eiffel Tower.

Desktop Computing in Style

Who says PCs have to be ugly? These days, electronic furnishings are as prominent in your home as your sofa. If you're looking for a desktop PC with more distinction than the basic beige box, check out Acer's Aspire.

There are few more-stylish ways to cruise the Internet than with the $3,248 Pentium-based Aspire—a windswept minitower with a rounded bezel and softly curved multimedia monitor that blasts full-screen video images and 3-D sounds. Feel the need for speed on the Net? The Aspire's 28.8Kbps fax modem and 133MHz Pentium, supported by a 256K L2 cache and 16MB of memory, provide as much cyberacceleration as you'll find, short of getting an ISDN line.

Stunning Appearance

You won't find any putty beige here either. The Aspire's case and monitor are available in two colors: deep emerald and dusty charcoal. The best part? You don't have to trade performance for appearance. Acer makes its own motherboard, BIOS, and a few other hard-to-find components, so the Aspire runs your Windows 95 applications about as fast as most other 133MHz Pentiums do.

The Aspire's 1.6GB hard drive comes loaded with 50 software titles. As with other SOHO systems, most of these applications are lightweight fillers; you'll want to delete them to reclaim disk space. But you do get a few popular productivity apps such as Microsoft's Works, NetCom's NetCruiser Internet browser, and Phoenix's great telephony suite that unlocks the Aspire's voice-enabled fax modem.

Practical Good Looks: Why settle for beige? Acer slips a fast 133MHz Pentium, a five-speed CD-ROM drive, a 28.8Kbps fax modem, stereo sound, and other multimedia extras into its stylish Aspire.

Fast 133: The Aspire runs common Windows 95 applications about as fast as other 133MHz Pentiums do, but its video components are somewhat slower.

The Aspire's out-of-box experience also includes the Acer Computer Explorer (ACE) interface, which is billed as a more intuitive way to organize your applications. Nah. Like the novice interfaces from Hewlett-Packard and Compaq, this kind of hierarchical grouping really works against Windows 95's navigational innovations such as the Start menu, desktop shortcuts, and even folders. Most people will want to disable ACE as quickly as possible.

The Aspire's monitor is distinctive: It has a built-in directional microphone, full-duplex speakers, and an internal amplifier—all of which run on a single power cord. There's no bulky AC adapter or speaker wires to add to the jumble at the back of your desk. You don't even have the Ross Perot–style ears hanging off the sides as you do with the otherwise excellent Hewlett-Packard and Compaq monitors. Acer's model is simple and appealing.

Color-Coded Acer has taken great pains to make the Aspire as usable as possible. It's amazing what a difference color-coded cables make. You don't appreciate this small touch until you're hanging upside down over the minitower trying to distinguish the mouse port from the keyboard port. The real beauty of the Aspire is all the wires it *doesn't* have.

As we were going to press, Acer had plans to update the Aspire line with a new motherboard and ATI's video chip set, which should boost performance considerably. Acer also plans to offer new software bundles, including several MPEG titles and Microsoft's 3D Movie Maker.

Acer did cut a few corners in audio and video standards, but overall the features and performance of the Aspire are on a par with Compaq's top-of-the-line SOHO system, the Presario 9564CD. The Aspire's edge is in its excellent (and $100 cheaper) monitor and stylish design. This is one PC that works as well as it looks. MIKE HOGAN

PHOTOGRAPH BY ARNOLD TOSKE/ID

FILEBOX

Aspire

Usability	★★★★★
Performance	★★★★★
Technology	★★★★
Verdict	★★★★

Premium 133MHz Pentium performance—and sculpted good looks, too.

Competition: Hewlett-Packard's Pavilion and Compaq's Presario 9564CD offer comparable performance and value. For sheer good looks, however, nothing beats the Aspire.

Features as Tested: 133MHz Pentium, 16MB of RAM (expandable to 64MB), 1.6GB hard drive, 15-inch monitor with speakers, QSound 3D Stereo audio, AuraSound speakers with FM synthesis, software MPEG 1 video, five-speed IDE CD-ROM drive, 28.8Kbps fax modem with voice messaging.

$3,248 est. street price
Acer America Corp.
(800) 733-2237, (408) 432-6200
Reader Service No. 676

Guide to the Ratings: ★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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Canon's Portable Odd Couple

How do you get it right and wrong at the same time? Just ask Canon.

The company's new 5x86-based InnovaBook 350CD packs full multimedia power into a lightweight, well-crafted portable, starting in the budget-pleasing ballpark of $2,799. Then again, the NoteJet IIIcx is, well, big. But it comes with a color ink-jet printer and scanner built-in.

Worth the Girth? At 10.2 by 12.3 by 2.6 inches—and more than 10 pounds when dressed for travel—you won't exactly want to prop up the NoteJet on an airplane tray table to answer e-mail. Nor will you relish lugging the $5,799 monster through airports.

But it can handle dozens of vertical applications no other notebook can touch: Scan in a schematic, diagram, or document; make changes to it; highlight the changes in color; then instantly print the corrected version. Built into the NoteJet is Canon's BJC-70 BubbleJet color printer (see "No-Think Ink-Jets," October 1995, page 524). Print quality is exceptional, given the machine's 360-dpi output. Bleeding is minimal, and color registration is surprisingly tight. The scanner is capable of 64 grayscales at 360 dpi. To use it, you swap out the ink-jet cartridge for the scanner head.

The NoteJet won't leave you wanting for power. It comes with a 90MHz Pentium (120MHz is optional), 8MB of dual inline memory modules (DIMMs) expandable to 40MB, a 810MB hard drive, 32-bit PCI local bus, and video accelerator with 1MB of VRAM. The machine's dimensions accommodate an enormous 11.8-inch active-matrix display, capable of 800-by-600-pixel resolution. The keyboard makes virtually no compromises in spacing or response.

Night and Day: Canon's expensive and hefty NoteJet IIIcx (right) comes with a color printer that swaps out with a grayscale scanner. On the other hand, the InnovaBook 350CD (left) delivers multimedia with quality components for the budget-minded.

Traveling Office: Slip a printed page under the NoteJet's keyboard to scan it. Make your changes, then print out a color copy by exchanging the scan head with a print cartridge.

Forget multimedia, though. The NoteJet is wired for sound, but there are no speakers—only jacks. You'll have to tote an external CD-ROM drive as well. These add weight and bulk to an already obese package (the AC adapter is bigger than a cellular phone). Also, the machine relies on nickel-metal hydride batteries. Given NoteJet's huge screen, fast CPU, and moving print-head, you'll want to bring an extra battery—or two. Expect less than two hours if you use the printer.

In other words, the NoteJet is a suitable platform for a few highly specific applications. But as a general-purpose notebook, far better solutions abound.

Multimedia to Many

Like notebooks that cost $1,000 more, Canon's InnovaBook 350CD features a floppy drive that swaps out for a quad-speed Enhanced-IDE CD-ROM drive (but not a second battery or hard drive). Powered by Cyrix's 100MHz 5x86 CPU, the notebook comes with 8MB of DIMMs, a 540MB hard drive, and a 10.4-inch dual-scan display. It weighs a light 6.6 pounds.

The InnovaBook is a full-featured machine. In addition to the standard audio jacks, it comes with an integrated microphone, an infrared transceiver, and two PC Card slots. Plus, the single speaker belts out plenty of sound.

Usability gets high marks as well. A center-mounted touch pad allows for a large wrist rest on either side. And the machine is trim (8.9 by 11.5 by 1.9 inches) and easy to carry.

You can equip the InnovaBook with a variety of CPUs—including a 75MHz Pentium. Too bad the display doesn't support 800-by-600-pixel resolution and the hard drive isn't larger. No matter: As equipped, our model costs $2,799. It's one of the cheapest ways to take solid multimedia performance on the road. MARTY JEROME

FILEBOX

InnovaBook 350CD

Usability	****
Performance	****
Technology	***
Verdict	****

No cutting-edge technology, but it's hard to beat the price.

Features as Tested: 100MHz 5x86 CPU, 8MB of RAM, 540MB hard drive, quad-speed CD-ROM drive, 10.4-inch display.

$2,799 est. street price
Canon Computer Systems
(800) 848-4123
Reader Service No. 677

NoteJet IIIcx

Usability	**
Performance	****
Technology	****
Verdict	***

The only notebook and color printer in one—but it's hefty.

Features as Tested: 90MHz Pentium, 8MB of RAM, 810MB hard drive, 11.8-inch display, 360-dpi color BubbleJet printer.

$5,799 est. street price
Canon Computer Systems
(800) 848-4123
Reader Service No. 678

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

PHOTOGRAPH BY ARNOLD TOSELIO

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Circle 215 on reader service card.

Voice Mail on a Shoestring

As the number of small-office executives continues to grow, so does the number of hybrid telephony-sound cards. These devices give small offices corporate-style voice mail and sophisticated fax-messaging systems. We evaluated three of the newest cards: Aztech Labs' Audio Telephony 2000, IBM's Multimedia Modem, and Reveal's VM500 Decathlon XL.

All three, as well as Creative Labs' Phone Blaster (see "Phone Home from the Keyboard," August 1995, page 86), offer many of the same features, but Reveal's Decathlon offers the best performance and great integration features.

Reality Check The most refined product of the three, the Decathlon, starts with an instructional video that gets you off on the right foot. You also get 1,000 password-protected voice-fax mailboxes, which can be configured to notify or page users of incoming messages, as well as to forward messages. The Decathlon is the only card equipped with Smart Speak, a new voice-recognition technology from Advanced Recognition Technologies that lets you activate calls with your voice. SmartSpeak is much more accurate than competing activation technologies.

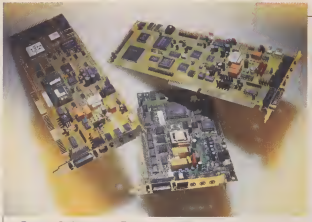
Aztech Labs' Audio Telephony 2000 shares many features with the Decathlon, but its one-console message-system interface, Multimedia Connect, was the easiest to use, allowing instant access and control over every feature, and providing up to 1,000 voice-fax mailboxes. The Audio Telephony records voice mail, but the audio circuitry is vulnerable to heavy feedback unless the microphone is carefully placed and adjusted. The Audio Telephony's fax-on-demand feature responded inconsistently to touch-tone entries.

As with the Decathlon, the synthesizer in the Audio Telephony (Yamaha's OPL-3 FM) delivers unimpressive sound. But its MIDI synthesizer can be upgraded to wavetable by attaching Creative Labs' Wave Blaster if you want better sound.

Dedicated vs. DSP While the Decathlon and Audio Telephony use dedicated hardware, IBM's Multimedia Modem is based on IBM's MWave digital signal processor (DSP), which can be programmed to perform a number of sound functions, as well as emulate various-speed modems. DSP is also handy for software upgrades; although all the cards reviewed here come with a 14.4Kbps modem, only the Multimedia Modem can be upgraded to 28.8Kbps. The same DSP acts as a wavetable synthesizer with a software MIDI engine, but the onboard DSP lacks adequate processing power to effectively handle concurrent operations, such as playing music while downloading data. The Multimedia Modem's software interface consists of several small applets that must be assembled like a jigsaw puzzle.

Hybrid telephony-sound cards have come a long way since last year. And while Aztech Labs' Audio Telephony 2000 and IBM's Multimedia Modem are worth the trouble of setting up and configuring, only Reveal's Decathlon challenges the wisdom of buying a modem and sound card separately.

S. JAE YANG



Small Office, Big Presence: Three new telephony-sound cards from Reveal (from left), IBM, and Aztech Labs offer integrated voice mail, fax-on-demand, and voice-activated calling options, all of which make your small office seem like a large corporation to callers.

PICKS MODEM–SOUND CARD COMBOS

Basic personal-message manager	Aztech Labs Audio Telephony 2000
Upgradable DSP solution	IBM Multimedia Modem
Complete, easy-to-use telephony with voice recognition	Reveal VM500 Decathlon XL

FILEBOX

Audio Telephony 2000

Usability ****
Technology ***
Verdict ***
Great interface, but subpar hardware.

$169 est. street price
Aztech Labs
(800) 886-8929
Reader Service No. 679

Multimedia Modem

Usability **
Technology ****
Verdict ***
The only DSP card of the bunch, but the software is needlessly difficult.

$279 est. street price
IBM Corp.
(800) 426-2968, (914) 765-1900
Reader Service No. 680

VM500 Decathlon XL

Usability ****
Technology ****
Verdict ****
Easy-to-use, accurate voice recognition make it your best bet.

$249 est. street price
Reveal Computer Products
(800) 326-2222
Reader Service No. 681

PHOTOGRAPH BY ARNOLD TORSILIO

Guide to the Ratings: *****Excellent ****Good ***Acceptable **Poor *Unacceptable

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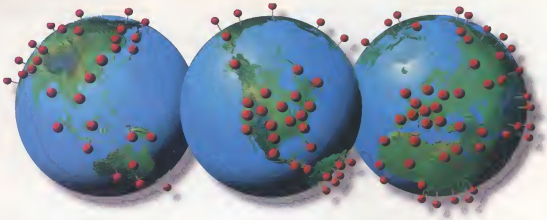

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LOTUS Business Solutions.

The Source for Business Productivity

Welcome to *The Source for Lotus Business Solutions*. This directory showcases some of the top providers of business solutions developed using Lotus technologies. It also contains valuable articles that explain the enhanced application development environment of Lotus Notes Release 4, and show how Notes can be used to link mission critical workflow applications to the Internet.

With over 11.5 million users, Lotus is by far the leading provider of software for building integrated messaging and groupware solutions. Solutions built with Lotus Notes, cc:Mail and SmartSuite help people get their jobs done faster and better and enable teams of people to work together more productively than ever before. Using their power to dissolve organizational and geographical boundaries, Lotus Notes, SmartSuite and cc:Mail products make it possible to run an efficient, distributed organization with satellite offices and mobile personnel all working with the same critical information.

Lotus' growing community of over 12,000 Business Partners are helping customers achieve tremendous productivity gains by using Lotus' award-winning products as the foundation for building a wide variety of applications and solutions for industries as diverse as health care, legal, pharmaceutical, insurance, manufacturing, retail, petrochemical, publishing and financial services. And now with Lotus Notes Release 4, Lotus Business Partners are helping customers get the most out of their Web browsers by allowing them to fully participate in Notes business process applications.

As you peruse this directory, please note that it contains a cross section of Business Partners, including application developers, consultants, service providers, education centers, system and network integrators, support centers and resellers. Right now they are designing, customizing, implementing and supporting Lotus groupware-based business solutions for companies just like yours — solutions that can deliver an unprecedented return on your technology investment and make your organization more productive than ever before.

Don Bulens
Vice President, Business Partner Programs
Lotus Development Corporation

A Word on Lotus Notes

Lotus Notes is the industry-leading integrated messaging and groupware product. Ironically, there is little agreement among industry analysts, customers, business partners and competitors regarding what Notes really is. It has alternately been described as a client/server platform for developing and deploying groupware applications, a platform for highly-specialized applications, and an open environment on which independent software developers can integrate their own products.

Notes is a product that has many faces. Most people think of Notes as the applications they see and run in the Notes environment — mail, discussion databases, etc. The power of Notes is that these applications are merely specific instances of a broad range of applications that can be written in Notes.

For example, there is no real "Notes conferencing system," rather, there are many instances of conferencing systems that can be written in Notes — because Notes is, at its core, an applications development environment. Oftentimes, someone will take an existing conferencing application and customize it, adding fields to the forms so that structure can be added for a specific purpose (e.g. when information is added about a customer inquiry, fields that state the details of the inquiry are filled in, the level of urgency is noted, etc.). Once this is done, a new conferencing application exists that is tailored to a specific type of collaboration.

These applications all take advantage of Notes' underlying platform-level services, such as messaging, object store, replication, security, and applications development. The Notes technology serves as a flexible groupware platform or framework upon which groupware applications can be built and deployed.

From its inception, Lotus Notes has combined three powerful group support technologies—messaging, distributed object store, and a rich applications development environment — to form a component architecture that serves as the basis for a large variety of groupware applications. It has been unique among groupware systems in putting forward a database model for groupware — both in terms of the underlying user metaphor and the design tools available to end-users and IT organizations. It supports end-user tailoring tools to make simple changes to data structures and database views. It also supports a rich set of APIs for developers who wish to build alternative UIs that also leverage the database model.

The implementation of the distributed database technology is also a unique advance — still far ahead of any other groupware product. Lotus Notes' robust replication over occasionally connected networks made deployment possible at a time when few organizations had achieved full network connectivity across their enterprise. It also anticipated the growing need for true disconnected use on workstations and notebook computers.

An entire industry of independent software vendors, systems integrators, application developers and consultants has evolved around Notes. Lotus continues to cultivate this community to help ensure that customers have the resources available to install, develop, deploy and manage Notes-based applications. Lotus

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What's New in Notes R4?

If you are a current user of Notes, Release 4 will impress you with its improved ease-of-use, navigation and more accessible functionality. Application developers familiar with the Notes development environment will appreciate the addition of robust new tools and facilities, and system administrators will find the management and scalability of Notes R4 greatly improved.

In designing the specifications for Notes R4, Lotus has targeted six functional areas — an improved user interface, enhanced mobile support, world class messaging, robust application development facilities, industrial strength scalability and manageability, and complete integration with the Internet. In some cases, existing functionality has been enhanced, made easier to use or made more readily accessible to the user. In other instances, entirely new functionality has been added, giving all users new tools and facilities with which to accomplish the same types of tasks or altogether new ones.

The guiding principles in developing the fourth release of Notes were:

- Make Notes more intuitive and easier to use for a more diverse spectrum of end-users, especially mobile users.
- Increase programmability and design options for developers and end-users.
- Upgrade Notes to support enterprise-wide and inter-enterprise mission-critical applications through increased manageability, availability and scalability.

Of course, the essence of Notes remains its distributed document store, its system level services such as replication and security, its integral messaging system and application development environment. The modifications discussed here simply make these core components of Notes more robust, accessible and easy to use.

Improved User Interface

For end-users, work in Notes consists of finding, viewing and creating (or modifying) information. Notes R4 improves the user experience for each of these activities.

Finding information. The first thing users of R4 will notice is the introduction of a multiple user interface that allows them to "surf" documents. The panes include a folder window, a document list window, and a document viewing window. This reduces the amount of effort required to browse through a database for a document.

Some R4 applications will depart entirely from the standard Notes view, employing Navigators — a fully graphical interface that makes use of hot spots to guide users to particular documents or functions. For example, a Notes application might appear as a regional map, with specific state and local areas that the user can "click" on to launch a view or a document, or initiate a Notes action, such as replication or update.

Users will also be able to conduct easier and more complete searches for information. The standard Notes full text search facility has been enhanced with a point-and-click query builder. Furthermore, users will be able to search on attachments and OLE objects in addition to fielded text.

Viewing information. The end user's ability to customize a view that meets his or her specific needs has been one of the hallmarks of Notes. Notes R4 makes this function easier to perform, so that any user can create and customize views.

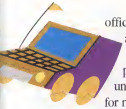
Reading a document will be easier in Notes R4. Users will be able to view file attachments without having to detach or launch them, even if the application used to create the document does not reside on the user's desktop. Notes R4 ships with over 150 file viewers for the most common spreadsheet, word processing, presentation graphics and other file types. Users will also be able to preview Notes documents before opening them, and documents themselves will include collapsible sections so that users can more easily manage browsing through and reading lengthy documents.

Creating and modifying information. Notes R4 includes an improved document editor to simplify many common end-user tasks. Quick bullets, named styles and enhanced table formatting, as well as context-sensitive menus and SmartIcons, make common editing tasks easier to perform. The introduction of a Permanent Pen eliminates the burden of highlighting and formatting each new comment or addition to an existing document.

R4 is a full OLE/2 container and client: it supports OLE/2 in-place editing, drag-and-drop and OLE automation.

Enhanced Mobile Support

The other focus of improvement to the end-user experience with Notes is in remote and mobile computing. True mobility allows the user to regard an

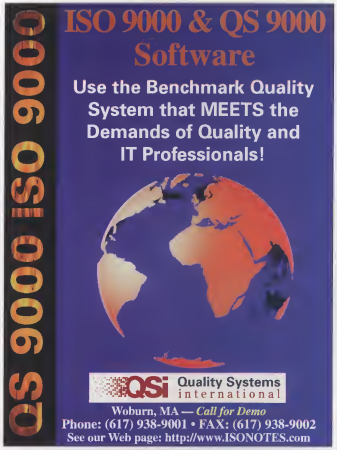


office as a set of tools and capabilities instead of a physical place. Notes is already unique in its support for mobile users, but R4 includes some additional enhancements. Mobile users can more easily perform selective replication using a point-and-click dialog box. On the road or at a remote site, users can employ Notes' location profiles, which "remember" special dialing instructions and mail and document handling preferences for replication.

When users need to replicate more than one database on more than one server, they now only have to make one connection to a server. The replication process will pass through the single connection to connect with other servers.

World Class Messaging

One of the most popular uses of Notes is as a mail system, and Notes R4 includes many significant enhancements to the Notes mail user interface and functionality. Most important is the adoption of the award-winning cc:Mail user interface specification, including cc:Mail's three-pane win-



Enhanced Partner Program Planned

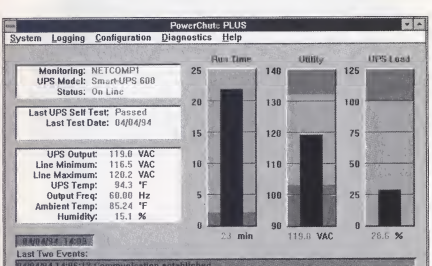
Latus and IBM are rolling out some enhancements to the Latus Business Partner Program during 1996. Plans include developing three levels of membership — Member, Qualified, and Premium — to recognize Partner experience, and segment Partners by business model. These models will closely resemble the core competencies of Partners — such as consulting, application development, and system and network integration — as well as those skill sets sought by customers looking to engage a Partner in a Notes or cc:Mail deployment. The levels are intended to reward partners for increased commitment and experience with the technology. The Program gives partners at each level an increasingly rich set of skills development and information tools.

New Partners will be in the Member category. They will receive resources such as CDs that offer Latus software and other business applications to help run their company. Latus believes this will give Members the opportunity to learn the technology and its uses firsthand. They will also be invited to "attend" monthly Latus Vision TV broadcasts and local field-based seminars that focus on various time-sensitive technical issues related to developing and integrating solutions with Notes, NoteSuite, and cc:Mail.

Qualified Business Partners will be required to have either a certified employee on-board or a certified commercial product that meets Latus standards. The business must also be connected to Latus on-line. They will have access to pre-release software as well as a wider range of marketing programs than Members.

Premium Partners — top tier partners — will be required, as they are today, to demonstrate a high level of commitment to Latus and the technology. They will receive a wider range of sales, marketing, and support programs than the other Partner levels. These include the opportunity to participate in cooperative marketing programs, sales leads, and the benefit of an assigned account representative.

No One Does Lotus® Notes® Shutdown Like APC



APC's PowerChute *plus* works in conjunction with APC's UPS systems to provide graceful, unattended shutdown of Lotus Notes servers in the case of an extended utility power interruption.

Serious Consequences

Ungraceful shutdown can have some serious consequences on your server. For instance, an improperly closed Lotus Notes Server can result in:

1) Lost database requests creating confusion, redundant work, and lost productivity

2) Lost/Corrupt data or databases significantly reducing productivity

3) Uptime delays while Notes performs "Consistency Check" to restore server to a working state.

Solution

APC's PowerChute *plus* offers a powerful, easy to manage solution for Lotus Notes Servers. To shutdown Notes via PowerChute *plus*, the user calls the APC shutdown utility for Notes. Once Notes is shutdown, PowerChute *plus* proceeds with normal system shutdown. When the NOS has been completely shutdown, PowerChute *plus* puts the UPS to sleep to be restarted when the power returns.

Be SURE you're protected. In addition to extensive unattended, system Shutdown, you'll get UPS testing/status to monitor the health of the UPS. You'll also benefit from Remote UPS management and Environmental/power monitoring. PowerChute *plus* tracks and logs power disturbances and provides remote control of UPSs/servers, so administrators can quickly diagnose power problems and avoid the costs of on-site support and system downtime. PowerChute*plus* provides network administrators with more useful information which allows greater flexibility in configuring the UPS's reaction to power events, significantly enhancing UPS performance.

Lotus Notes and PowerChute *plus*

APC's PowerChute *plus* power management and diagnostic software is compatible with more than 40 operating systems. PowerChute*plus* works with APC UPSs to shutdown your system automatically and gracefully in the event of an extended power outage, whether you're there or not. For Notes users an added script file shuts down Notes servers just before shutting down the operating system.

"PowerChute plus significantly adds to the reliability and uptime of Lotus Notes Servers by protecting them from all types of common power problems. The remote power management and diagnostics provided by APC's PowerChute plus is a very valuable tool for any Lotus Notes system administrator."

— Jeff Papows
VP Notes Product Division,
Lotus Development Corporation

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Remote Reboot Capabilities

Notes servers running NotesView can be managed remotely using APC's PowerNet SNMP Adapter accessories. These allow for hard reboot of a remote Notes server that has locked-up.

In addition, APC's Call-UPS*II* accessory can bypass network lockups by direct dialing the Notes server to gain the access necessary for remote reboot.

Modem-line protection

With many remote users connecting to Notes servers via modem, APC recommends the new PNET4 and PTEL1-4 data line surge suppressors to protect your server from incoming surge induced damage. The internal modem of a laptop is highly susceptible to surges travelling along serial and modem lines directly to the CPU, and must be protected by an APC ProtectNet device. Call now for info.

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dow for easy scrolling and viewing of mail messages. This not only makes the Notes mail experience more intuitive, but makes Notes R4 visually consistent for cc:Mail users who have switched. Also aiding in migration is the inclusion of a MAPI service provider interface (SPI) in the Notes server, which allows MAPI clients — including the forthcoming cc:Mail release 7.0 — to access the Notes object store for messages.

The Notes mail database will also feature a number of ease-of-use enhancements. Users will be able to take advantage of a number of delivery options including "mood stamps" — graphical icons and symbols to indicate the urgency or confidentiality of a message; "prevent copying," which does not allow the recipient to forward or copy the content of a message; and "trace path," which provides the server route that a message traveled through to reach its destination.

Another enhancement is the ability to add proxy addresses to a directory, so that in addition to Notes addresses a user can have an Internet, X.400, cc:Mail or other mail address.

The Notes mail database will also include a set of predefined agents that a user can invoke, including an "out of the office" message that informs senders of a user's availability, an "add sender to address book" function that automatically copies the contents of the "FROM:" field to a personal name and address book, and an "archive selected documents" function that will automatically create an archive at convenient hours.

Robust Application Development

In Notes R3, Lotus concentrated on functionality to help developers build workflow applications to aid organizations in automating critical business processes. Companies using Notes soon found that they could improve their core processes — customer service, sales prospecting, new product development — in ways never before thought possible.

In Notes R4, Lotus has significantly enhanced the programmability of Notes by extending the Notes API to more platforms and languages, adding new functionality to the native Notes development environment, and further easing the deployment of Notes applications.

Programming at the API level. Professional application developers often approach Notes from the Notes API, from which they enjoy direct programmatic access to Notes' rich functionality and system-level services. R4 improves and extends the Notes API in several key ways. First, the Notes API has been extended to the Macintosh platform, giving Macintosh developers all the features and functionality enjoyed by OS/2, Windows and UNIX developers. Furthermore, Lotus has raised the level of

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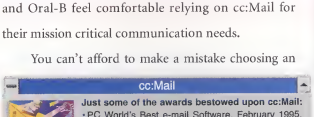

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abstraction for developers using high-level languages and the Notes API. There are specific implementations of the Notes R4 API that will support Visual Basic, LotusScript and C++. These higher level APIs reduce the complexity of working directly at the API level, and exploit developers' existing expertise in popular programming languages.

Programming in the native Notes development environment. Notes R4 improves the native Notes development environment in two ways. First, it provides developers with altogether new, modern and industrial strength tools. Second, it enhances the ease-of-use from a developer's perspective, reducing the number of steps required to complete a programming task and making the development environment more intuitive.

New tools and functionality. The most significant new tool is LotusScript, a BASIC-compatible structured programming environment. LotusScript is a fully object-oriented programming environment with classes, methods and properties, providing developers with a consistent way to access Notes services.

Integration with non-Notes data is easier in R4 through the use of LotusScript Data Object (LS:DO), a LotusScript class and set of methods, properties, and events that allow access to relational and legacy databases using ODBC. LS:DO provides both read- and write-access to back-end databases, so that Notes workflow and replication capabilities are available to developers who want to create advanced applications that combine relational databases and Notes.

Notes R4 also includes an agent builder. Agents are Notes application logic (written in LotusScript or the macro language, or created from simple actions) that allow developers to automate application tasks on both servers and clients. Such tasks include data handling, replication, and messaging services. Since agents may run on both Notes servers and clients, developers have complete control over the Notes messaging and database infrastructure.

Improved Development Environment

In addition to providing developers with new tools and functionality, Lotus has concentrated on making it easier to create Notes applications by enhancing the development environment ▶ pg. 14

STATE OF MISSOURI S WORDLINK

CASE STUDY

In March 1995, the Missouri State Highway Patrol chose to implement Lotus Notes to manage its paper-based investigation process. The Patrol's Information System Division managed a project that resulted in the development of their Violent Crimes Tracking and Management System. Using internal staff and consulting services provided by WORDLINK, a Premium Lotus Business Partner headquartered in Champaign, Illinois, the application was successfully implemented in July 1995.

Now, with Lotus Notes, as a call comes in that a violent crime has occurred, analysts are dispatched to the scene carrying a laptop computer running Notes. The analyst completes the proper reports, inputting information on every detail and keying in information each witness has provided. The analyst begins by entering the basic information on the main report form, case number and date. Then each subsequent report is linked to the first. There is a standardized form for autopsies, witness statements, etc., and Notes manages the information on those reports so that it can be viewed in a consistent format.

"The new system has improved our ability to manage the high volume of data associated with violent crime investigations," said Jerry Wethington, IS Director of the Highway Patrol. It allows the investigators to logically organize the evidence and information collected. "Utilizing Notes' full-text searching capabilities has enabled investigators to identify common characteristics among cases that would in the past have seemed unrelated," commented Wethington. The ability to connect case information increases the number of leads to investigate, flagging information that the officers may not have seen under the old system.

"Notes also provides us with the ability to put together a formal, comprehensive case book for the prosecution," said Wethington. With fully-indexed, standardized reports, cases are well organized and much easier to investigate and prosecute, which should result in more convictions.

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But what about information you receive or produce that doesn't start out in electronic form? Such as video order forms, faxes and correspondence. Or materials to your business, like X-rays or photographs.

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itself, making common tasks easier to complete and presenting the developer with a more intuitive and useful interface.

Two features that current Notes developers will readily recognize are the use of subforms and a non-scrolling action bar within forms and views. A subform can be inserted within any number of other forms. This improves the degree of reuse of Notes form design. Subforms are stored the same way as forms in a Notes database.

The R4 action bar is a non-scrolling area that remains "affixed" to the screen when the user scrolls through a Notes form or view. This allows developers to create actions on the action bar while looking at the appropriate fields on the screen, rather than switching back and forth.

For end-users with only moderate Notes development experience, Notes R4 includes considerable programming functionality without requiring any knowledge of LotusScript or macro language syntax. More fully functional application templates combined with easily modified canned actions makes end-user application development more realistic for a larger number of users.

Notes R4 includes a number of other features that make it easier to get end users up and running with a Notes application. Once in a Notes applications, users can take advantage of Navigators and hot spots. For example, developers can create a Navigator that displays a map of a sales territory. The user clicks with a mouse on a hot spot, such as a city within the map, and the developer can display a Notes Document and/or View. With Navigators, developers can create Notes applications that do not require that users learn the Notes user interface. Instead, the end-user's business terms and visualizations are used in Navigators to assist end-users through the application.

Users will also find it easier to launch executables from directly within the Notes Workspace and from within OLE servers.

Industrial Strength Scalability and Manageability

Notes R4 has been designed to fully support enterprise-wide and inter-enterprise mission-critical applications through increased manageability, availability and scalability. This has been achieved by introducing a new management tool and improving the reliability and scalability of Notes servers.

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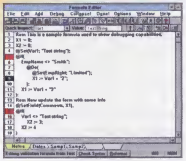

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CASE STUDY

PerSeptive Biosystems designs, manufactures and markets proprietary products and systems that increase the ability to purify, analyze and synthesize biomolecules for applications from research to manufacturing. Based in Framingham, Massachusetts, PerSeptive Biosystems began looking at Lotus Notes in December of 1994 to provide a vehicle for the sales forces' distributed information.

Prior to implementing Notes, all of the company's sales and marketing information existed in several disparate systems. These different applications made it very difficult to manipulate and view information in different ways. In addition, their sales force was spread across the world and they were in need of a system that would effectively distribute leads to the field.

For the installation and application development of Notes, PerSeptive Biosystems partnered with Cambridge Software Group — a Premium Lotus Business Partner that specializes in Lotus Notes consulting services for Notes Applications Development and Notes Integration with other applications. Cambridge Software assisted with the development of an advanced quoting system for PerSeptive Biosystems' sales application.

As the company began to implement its Notes-based sales force automation system, it realized that other Notes-based databases were essential to build a foundation for the sales administration database. Therefore, PerSeptive began to develop applications that focused on other aspects of the company — such as marketing and communications, help desk information, human resources and administration — and found that Notes was able to help where qualitative information was needed regarding clients, projects and equipment.

With Lotus Notes, PerSeptive Biosystems is able to leverage fewer resources worldwide as the number of Notes-based applications continues to grow. And, through shared databases, all employees, regardless of location, are able to communicate and share information that is vital to the success of the company.

MERCK & CO.
A SANDPOINT COMPANY

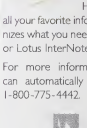
CASE STUDY

As a worldwide, research-based pharmaceutical manufacturer, Merck & Co., Inc., based in Whitehouse Station, NJ, relies on several sources of external information for monitoring any possible competitors to its pharmaceutical compounds during development and marketing, tracking the scientific and commercial potential of its existing products, and far up-to-date information on recent clinical trials and new chemical entities. Until two years ago, Merck relied heavily on internal staff to manage and disseminate this information.

In 1993, Tom Oberleiton, Associate Director of Business Information for Merck & Co., reevaluated the process and transitioned over to an integrated system based on Lotus Notes and a product called SandPoint Hoover™ from Lotus Premium Business Partner, SandPoint Company in Cambridge, Massachusetts. His aim was to switch from a service bureau internal structure and leverage an technology to empower Merck's decision makers with direct access to information at the desktop level. He chose Lotus Notes as the best management and dissemination platform and Hoover as the best software for gathering information. Providing a single user interface, Hoover is an active "information agent" that searches, retrieves and integrates information from over 5,200 sources, including live news feeds, on-line databases, and internal intelligence.

Oberleiton and SandPoint worked together to tailor Hoover to Merck's specific needs. Incorporating targeted solutions such as SandPoint's Competitor Compound Tracking System and a number of Pharmaceutical Databases, the result was a complete network that allows Merck & Co. to receive customized news feeds on a daily basis and search at will through important pharmaceutical studies, on-line databases and publications.

Is your company fishing for ways to deliver current awareness and integrated research information to your Notes workgroup?



Wade into the gushing flow of electronic data—realtime news, online services, and corporate intelligence—and you can spend hours casting about for information.

Unless you have SandPoint's Hoover.™

Hoover is information agent software that fishes all your favorite information streams. It integrates the sources, organizes what you need to know, and delivers it to your Lotus Notes® or Lotus InterNotes® workstation.

For more information about how Hoover from SandPoint can automatically land the information you want, call us at 1-800-775-4442.

SandPoint

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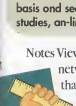


Notes View is an SNMP-compliant network management tool that provides administrators with centralized monitoring and control of servers. With Notes View, administrators can view the status of servers on a real-time basis and manage servers remotely. They can make changes to field-based servers from a central management site, or vice versa. Changes can even be made from a Notes View laptop that is disconnected from the network. As a modern management tool, Notes View features a graphical user interface, and provides administrators with topology maps as well as standard Lotus facilities such as InfoBoxes and charts. Because it is SNMP-compliant, it easily sits within a company's SNMP-based management platform, such as IBM NetView/6000 and HP OpenView.

R4 is based on a full 32-bit architecture, allowing it to fully exploit the larger multiples of multi-processor machines. This will improve the availability and scalability of servers, helping to ensure user access and reducing the number of servers required to support a large Notes implementation. The improved scalability should support over 500 active users in a concurrent session and up to 1,000 light users.

Furthermore, replication has been streamlined and simplified. First, speed has been increased by order of magnitude, reducing the amount of time consumed by replication. Second, R4 supports field-level replication, reducing the amount of data that must be synchronized during the replication process. And third, hub servers will support multiple replicators, so that replication can be performed in parallel instead of as a sequential process.

Complete Integration with the Internet

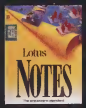
Notes R4 builds upon the current Internet support of R3 to more fully integrate Notes with the Internet.

The replication process will be easier to set up and manage, with IP addresses appearing as any other Notes server in a replication dialog box. Administrators will be able to set replication time-outs to account for the sometimes unpredictable nature of Internet connectivity. A server can be directed to wait for a specific period of time to allow another server to get connected.

Support of "anonymous" clients — access to a server on the Internet without exchanging public and private keys — will allow an organization to make a Notes server accessible to any Notes user on the Internet.

The InterNotes Web Navigator can translate a URL into a Notes document. The document retains the fidelity of its original look and content, but is now managed in a Notes environment. LOTUS

NOTES IS WORKING.



Today, Lotus Notes® helps organizations of all sizes coordinate critical business information. To get the right products to market faster. To get salespeople the information they need to close the deal. To streamline processes like new drug approvals, mortgage loan processing and health care delivery.

Notes™, and only Notes, gives you access to all the information you need – whether it's in e-mail, a relational database or host system, your favorite desktop

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For more information on Lotus Notes or for a copy of The Book on Groupware, call 1-800-828-7086 ext. B503 (1-800-GO-LOTUS in Canada). Or explore Lotus on the World Wide Web at www.lotus.com.

Lotus

Working Together

(NOTES FROM THE FIELD, BURGER KING)

In 1994, we needed to rapidly deploy field-based teams in a major Burger King re-engineering. Lotus Notes emerged as the only product capable of meeting our timetable. Its advanced replication, superior mobile and collaboration features proved essential. In just 7 months we had 1,200 users worldwide. And by year end, we had developed and rolled out five major applications.

Neil Foley

Director, Distributed Systems, Burger King Corporation

application, or even on the Web. And Notes' unique replication technology lets you be part of the team, even when you're traveling. That's because Notes is the only proven, open platform for communicating, collaborating and coordinating mission-critical business processes.

Your people work around the clock. They work around the world.

They're working on the future of your business. Shouldn't Lotus Notes be working for them?

Lotus Notes and the World Wide Web

Both Notes and the Web were invented to support collaboration over local and wide area networks. Like other technologies, such as relational databases and desktop productivity tools, that share some attributes with groupware in general, the Web is sometimes viewed as redundant to, and thus competitive with, Notes. However, just as those other technologies are appropriate to their own class of applications and have proven of greater value when integrated with Notes rather than used instead of it, a look at the Web and its applications reveals its distinct and complementary nature to Notes as well.

World Wide Web Applications

The Web provides a global, public means of information publishing and consumption that is based on a "pull" model. Web clients specify the URL or document name and request a copy of that HTML page, which is transmitted across the net, then displayed on the client's workstation. Those pages offer a document-centric, rich-media presentation of information, as well as a hypertext linking structure.

The World Wide Web is an ideal way to make marketing, corporate, and service and support information readily available for public access. In this way, the Web naturally complements traditional forms of communication, such as direct mail, advertisements in various media, "fax back" systems, toll-free telephone lines, and interactive voice response systems. Planned security and application development enhancements to the Web aim to make it a viable medium for transaction-based electronic commerce.

Lotus Notes Applications

Like the Web, Lotus Notes has been used by many organizations to serve as a publishing medium, focused more on information sharing within and among organizations. It has been Notes' role as platform for application development and deployment that has established it as a groupware standard. Notes' object model, messaging services, security facilities, desktop and database integration and client/server architecture lend themselves to a class of applications not feasible on the Web. The characteristics of such applications include one or all of the following:

- **Interactivity.** Business collaboration requires the active participation of team members, not just the one-way sharing of knowledge from one source to many readers. Brainstorming, idea sharing and problem solving require that all participants contribute their input.
- **Notification.** Finding the right piece of information at the right time by browsing through a library of documents is an inefficient process. In many cases, users would benefit from having the information find *them* at just the right time. A system that combines information storage with integrated messaging services, such as Notes, augments the "pull" model of the Web with a "push" model of information distribution. When an author posts a new item to the system, an E-mail message can also be created that contains a pointer to that information and sent to the appropriate coworkers. Recipients simply click on the pointer to view the relevant document. To do this on the Web is a complicated multi-step process.
- **Triggered processes.** Similarly, Notes itself can monitor the state of data, initiating an action based on the state of particular fields. In many cases, the action may be the direct result of a lack of user activity (a sales person has not contacted a customer in 30 days, a contract to be approved is waiting for a specific person for over 24 hours) or an external condition (a client's credit rating has changed, a deadline is approaching). Such an application requires the ability to develop server-based agents.
- **Customization.** In many collaborative applications, individuals will find reason to want private, tailored views of data that support their specialized tasks. The capability to flexibly view information in different ways is fundamental to enabling all participants to grasp the key elements of the business process and the context in which they exist. Notes forms and views provide each user with the ability to customize how information is presented to them without affecting the logic of an application.
- **Multiple levels of security.** Some business documents contain information appropriate for some readers but which should remain hidden from others. For example, a personnel review form might be routed through a series of team members for comments. It would not be appropriate for all members to be able to read the comments made by others or view the salary information, so those fields should be hidden from general view, while authorized readers have access to the entire form. While the Web is developing some measure of security and authentication, it will be some time before it can be applied to specific fields within a document.
- **Integration with other resources.** Not all information is native to a collaborative system: some shared information resides in desktop productivity tools (e.g. spreadsheet tables) and host-based relational databases. Collaborative systems do not replace these systems, but rather must seamlessly integrate with them, so that as changes are made in a desktop document or a database, they are automatical-

ly reflected in the collaborative system.

• **Mobile user support.** More and more users today need to perform their work away from the office. Users need to be able to continue to browse through data, compose edits and responses, and complete steps in a workflow process even while disconnected from the corporate or public network. Replication services allow users to make a copy of a database on a laptop computer, work with it while traveling, and later synchronize all changes with the server.

Notes and the Web: Distinct & Complementary

By its very nature, groupware overlaps with other information technologies. The commonalities between groupware and these other technologies do not render them competitive; on the contrary, groupware is essentially complementary to them. Each technology supports a distinct class of applications, while their integration with groupware leverages the strengths of both.

Likewise, the World Wide Web excels at a class of applications that involve the one-to-many publishing of public documents. The straightforward nature of "broadcast" applications lends them to the generic use of so-called "shareware" client and server software. Investments by third parties in the Web's forms-based metaphor are largely aimed at a set of transaction processing (i.e. electronic commerce) applications. Notes, on the other hand, excels in a broad class of business process applications that require ongoing action by some or all participants and in which the state of data as it moves through the process is as important as the data itself. The complex nature of these applications tend to require a highly sophisticated and customizable environment, such as Notes, which has demonstrated a remarkable return on investment when applied to mission-critical business processes.

Applications that include both types of requirements will naturally benefit from the integration of Notes and the Web, in which information most appropriately gathered and managed by Notes can be easily made available to the large population of Web users, and, in turn, an event triggered by an activity on the Web can quickly become part of a non-public business process. LOTUS

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The fax machine and the copy machine are at polar opposites on my floor. And the nine people I had to get drafts of my document to? Two on my floor. Three on floors you'd be embarrassed to take the elevator to. And four not even in this office.

How I walked four miles in a 9,000 square foot office.

And then I had to get each draft back with comments, and incorporate those comments into my document by the following morning. So I basically faxed and copied and delivered and then typed and re-typed and re-faxed and re-copied and re-delivered until my feet hurt and my legs were tired and I was sitting there starting to wonder why the heck running shoes aren't considered standard business attire

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COLLEGIATE HEALTH CARE & NETIMAGE

CASE STUDY

Because of Latus Nates, Callegiate Health Care, based in Narwalk, Cannecticut is able ta aperate as a natianal campany and pravide its custamers with better service.

In 1993, Netlmage, a Latus Business Partner, implemented Latus Nates far Callegiate Health Care. Nates has allawed Callegiate ta aperate as a "virtual" campany. According ta Callegiate Health Care's CEO Brett Prager, "Becaming natianal became 'real' mare quickly than expected because af the technalagy." Since this installatian, Callegiate has been able ta hire the right emplayees based an skill and experience rather than what state they live in.

Nates allaws Callegiate emplayees lacated in regianal affices thraughout the United States ta cammunicate via E-mail thraugh Nates. The sales farce is mare productive because their cammunication is quicker and mare frequent. And, Nates databases allaw sales managers to track sales as they are happening. Data can naw be accessed by all campany members. Prior ta the Nates installatian, data was stared an each individual's system and documents were passed fram persan ta persan. Nates naw pravides access ta databases that allaw users ta share infarmation simultaneausly.

Callegiate has also been able to increase its effectiveness in servicing its customers in university health care centers, wha autsource their health care facilities ta Callegiate. Direct lines af cammunication between Callegiate Health Care and the university health centers have been apened and have accelerated business processes. In the fall of 1995, with the help of Netlmage, Callegiate plans ta rall aut Nates ta the medical practitianers. They will use Nates applicatians ta schedule and track patients. Specific Nates applications have been developed by Netlmage far the health care centers and have been instrumental in Callegiate Health Care gaining new business.

"We are using Nates ta radically change health care by taking wha has been a traditianally expensive system and making it affardable ta the camman man," Prager said.

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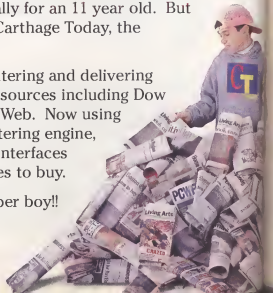

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Peachtree Accounting 3.5 for Windows

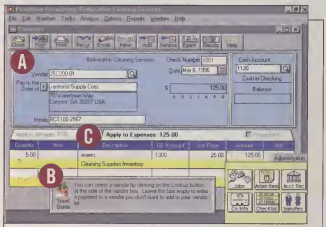
Push-button Electronic Bill-Paying

SNEAK PREVIEW

Imagine if your business could pay all its bills electronically with the simple click of a button. Goodbye to paper checks and envelopes, and farewell to that horrible dot-matrix printer. Electronic banking has traditionally been a luxury only large corporations could afford. With Peachtree Accounting 3.5 for Windows, electronic banking is now affordable for small and midsize companies. It's easy to set up, simple to use, and most important, completely secure—the corporate-payroll company Automatic Data Processing (ADP) handles all the transactions.

According to an ADP survey, the average small company writes about 100 checks a month (not including payroll checks) at an average cost of almost $2.50 per check after labor, paper, and postage expenses are factored in. Initial estimates suggest that with electronic banking, this cost drops to approximately $1 per check.

E-Checks In the early beta version we looked at, all of Peachtree's online payroll and bill-paying were nicely integrated. Rather than printing out a check to pay a bill, you just click on a button to send information via modem to ADP; ADP takes care of the rest. It's ironic that the market-leading QuickBooks Pro 4.0 didn't have this feature first, since Intuit is out front with online banking and bill-paying. ADP says it will integrate its technology into additional accounting packages in the future.

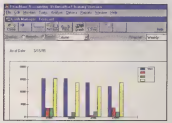


Paperless Bills: Peachtree Accounting 3.5 is the first inexpensive accounting package to offer electronic bill-paying and banking. Finally, you don't have to spend hours writing or printing checks.

A. Peachtree's interface resembles **traditional paper forms** for data entry.

B. Smart Guides offer task-specific help throughout the program.

C. Update your accounts while you **cut a check.**



Boost Your Bottom Line: Peachtree's Cash Manager shows you the ins and outs of your cash flow in a colorful graph or chart.

Other big improvements in Peachtree Accounting are its multimedia tutorials and Smart Guides that help you set up the books. It also offers more than 75 templates of detailed, small-business models to help simplify the setup process. Video and audio tutorials help you set up your chart of accounts; opening balances; inventory; and vendor, customer, and employee records by asking you easy, straightforward questions. The new audio feature is particularly helpful because you can listen to detailed instructions while typing in data and shuffling bank statements.

Shared Accounting Unlike most other inexpensive accounting packages, Peachtree offers multiuser networking. If you have more than one person balancing the books in your office, you know how difficult it can be to share files. DacEasy's Accounting & Payroll '95 is the only other package in this price range that also offers networking, but it isn't as easy to use.

Peachtree offers the same core accounting features as its competitors: payables, receivables, and payroll—all the bases are covered. Intuit's QuickBooks Pro remains the interface champ and the easiest program to use, but the integrated electronic-payment system in Peachtree makes it the software of choice. While other packages are scrambling to get online, Peachtree already is. If you want online disbursement in a multiuser accounting program and you want it now, Peachtree Accounting 3.5 is the ticket. **MIKE HOGAN**

FILEBOX

Peachtree Accounting 3.5 for Windows

Usability	****
Technology	*****
Verdict	****

Powerful network-accounting package—and the first to include electronic bill-paying.

Competition: Intuit's QuickBooks Pro and BestWare's M.Y.O.B. Accounting both have better interfaces, but neither supports multiuser networking or online transactions. DacEasy's Accounting & Payroll '95 is the only other multiuser package in this price range, but it isn't as easy to use.

System Requirements: Windows 3.1 or later, 386 CPU, 4MB of RAM, 11MB of free hard-disk space. For the multimedia version, at least 8MB of RAM, 15MB of hard disk space, sound card.

$99 est. street price
Peachtree Software
(800) 228-0068, (770) 564-5800
Reader Service No. 683

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

Desktop Graphics Come Alive

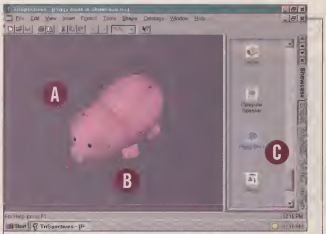
Drawing is out. Modeling is in. Or so you might deduce from the spate of 3-D graphics programs tempting you to add depth and shadow, among other things, to your otherwise two-dimensional renderings.

With 3D/Eye's TriSpectives Professional and Caligari's trueSpace2, you can bring your images to life with textures, shadows, layers, composites, animations, and several other enhancements. If done well, the results look more like photos or images out of Disney's *Toy Story* than flat drawings.

TriSpectives and trueSpace2 deliver all the 3-D you can imagine, but they're geared toward more-experienced players: graphic artists, product designers, multimedia producers, and others familiar with the concepts and intricacies of working in 3-D.

Drag-and-Drop 3-D TriSpectives is the more structured of the two programs, and hence easier to learn. Create, combine, and animate 3-D images by just dragging and dropping them onto the page. Designed to run under Windows 95 or Windows NT, TriSpectives also features complete OLE support and is compatible with Microsoft's Office business-application suite.

Start from scratch with its 2-D and 3-D drawing tools if you like, or use TriSpectives' series of prebuilt 3-D objects aptly dubbed IntelliShapes. You can simply drop one or more of these shapes or textures from the tabbed catalog into the main working area, where you can extend or manipulate them. Their programmed intelligence lets them respond to changes and interact with other shapes in logical, even thoughtful, ways. Shapes routinely slide around and blend into each other without special cues from you.

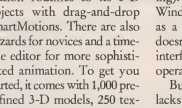


Put It in Perspective: New 3-D modeling programs like TriSpectives Professional (above) and trueSpace2 add a new dimension to PC graphics. TriSpectives includes a library of professional 3-D images.

A. You can **drag and drop** 3-D objects as is, or **edit** them onscreen in real time.

B. Grab any editing point to **shape, resize, and contort** 3-D images.

C. The tabbed catalog holds a **library** of 3-D objects.



Real-time 3-D: TrueSpace2 speeds 3-D editing with a real-time preview window so you can see rendered effects as you edit objects.

TriSpectives can apply animation routines to its 3-D objects with drag-and-drop SmartMotions. There are also wizards for novices and a timeline editor for more sophisticated animation. To get you started, it comes with 1,000 predefined 3-D models, 250 textures and surfaces, and 50 templates—and it supports all kinds of graphic file formats.

True Modeling TrueSpace2 can be somewhat overwhelming at first. It has a relatively spare interface, and puts all of its tools at your disposal via various pop-up boxes and icons located at the bottom of the screen (although they can be moved to your liking). TrueSpace2 runs under Windows 3.1 or Windows 95 as a 32-bit program, but it doesn't religiously follow the interface conventions of either operating system.

But whatever trueSpace2 lacks in Windows manners, it makes up for in workstation-class power for 3-D modeling, rendering, and animating. Perhaps its best feature is the real-time preview window, which lets you see one or more rendered versions of a 3-D model while you're editing from, say, a wire-frame display.

Both products are also available in special editions. Caligari offers trueSpace/SE, which is essentially a repackaged version of trueSpace 1.0, for $149. 3D/Eye sells a slightly scaled-down version of TriSpectives (without the *Professional* suffix) for $299. If you just want to dabble in 3-D imaging, go with Asymetrix's 3D F/X, a simple and affordable drag-and-drop 3-D package. But for serious 3-D work, TriSpectives Professional gives you extensive Windows features, while trueSpace2 provides greater graphics power. CHRIS O'MALLEY

FILEBOX

TriSpectives Professional

Usability ****
Technology ****
Verdict ****
Making sophisticated 3-D effects is as simple as drag and drop.

System Requirements:
Windows 95 or Windows NT, 486 CPU, 16MB of RAM, 25MB of hard disk space, CD-ROM drive.

$499 est. street price
3D/Eye
(800) 948-9533, (716) 671-5041
Reader Service No. 684

trueSpace2

Usability ***
Technology ****
Verdict ***
Innovative 3-D modeling and rendering tool—but only pros need apply.

System Requirements:
Windows 3.1 or Windows 95, 486 CPU, 8MB of RAM, 10MB of hard disk space, CD-ROM drive.

$495 est. street price
Caligari Corp.
(800) 351-7620, (415) 390-9600
Reader Service No. 685

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

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Iomega® Zip drives zip faster when you use a SCSI (pronounced scuzzy) host adapter. Up to 600% faster than conventional parallel port connections. It's just one more reason to give your PC a SCSI connection. To learn more about Adaptec® SCSI host adapters and to enter to win a free Zip drive, or other prize,† call 1-800-655-3977 ext. 5640, or visit our home page at http://www.adaptec.com*

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New! SOFTWARE: Frontier CyberSearch, Corel Internet Mania, Quarterdeck WebCompass

Cut Your Surf Time on the Net

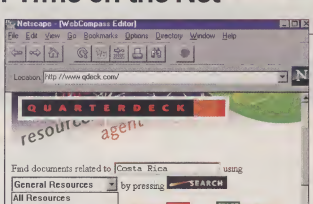
Anything and everything is somewhere online, but finding it can be impossible. Though dozens of search sites try to make Internet searching easy, few match the comprehensive, offline search tools of Frontier Technologies' CyberSearch, Corel's Internet Mania, or Quarterdeck's WebCompass.

All three CD-ROM–based products save you time and money by letting you conduct offline, intelligent searches with any Web browser on the market. Beyond this basic similarity, each product is unique.

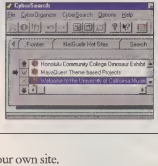
I-Way Mania Corel's $19 Internet Mania is a useful collection of Internet utilities that enhances your online experience. You provide the browser; Corel supplies the utilities.

The most useful of Corel's utilities is a version of Lycos, a popular online Internet catalog. This offline version includes 450,000 entries from Lycos's online version, which catalogs more than 12 million entries. The idea is to search through the offline entries first, and then click on the link to the site to go online. This not only saves connect time, but also is faster than going to Lycos directly, since it's often slowed by heavy traffic. On the other hand, the online site is much larger and more up-to-date.

Other Internet Mania utilities include Web Page Update Notifier, which automatically informs you of changes in user-defined Web sites (similar to Netscape's SmartMarks add-in); NewsScan, which performs similar updates of newsgroups; and QuoteScan, a stock ticker that delivers 20-minute–delayed stock prices. Corel also includes a Wizard-like HTML authoring tool, an FTP client, and Personal Web Server for managing your own site.



Web-Search Orientation: Quarterdeck's $99 WebCompass is a timesaving way to find whatever you're looking for on the World Wide Web. With a single query, WebCompass scours several search sites, and then summarizes, organizes, and stores the information the way you want it.



Look It Up Offline: If you don't mind sacrificing the completeness of the online version of Lycos, you can sample the CD-ROM version with CyberSearch.

Cyber Search, from Frontier Technologies, takes the Lycos-on-a-disc idea a few steps further. With a subscription to CyberSearch ($9.95 a month), you get more than 500,000 entries from the Lycos catalog. Using it as a starting point to refine your searches can save time and money you'd otherwise waste online.

Subscription to Surf CyberSearch's Lycos catalog is more complete than Internet Mania's, but even its monthly updates can't keep up with changes on the Web. For the most complete search, none of these offline catalogs match the online version of Lycos (http://www.lycos.com).

The most unique search tool of these three is Quarterdeck's $99 WebCompass, a search engine for the Web that lets you send a single query to multiple Web-search sites at one time. The program uses agents to return an organized summary of the information you want.

Quarterdeck's WebCompass includes a 40,000-entry open database connectivity (ODBC) index of search topics, from general (like sports) to specific (like San Francisco 49er Jerry Rice). As with the Lycos-on-a-disc model, you can search through this index offline. WebCompass probes dozens of search sites, including Yahoo, WebCrawler, Lycos, Excite, and OpenText, and returns presorted summaries of sites that match your queries.

WebCompass also lets you build a personal index of topics and sites you're interested in. Then, as does Internet Mania, WebCompass automatically informs you of any changes to these topics or sites.

All Internet users will benefit from Corel's Internet Mania, an inexpensive, useful package of Internet utilities. And Frontier Technologies' CyberSearch is a sure bet for offline searching via monthly Lycos updates. But for the most comprehensive offline Internet searching, neither of these utilities comes close to Quarterdeck's WebCompass. RICH SCHWERIN

FILEBOX

CyberSearch

Usability ***

Verdict ***

Monthly updates on CD save time and money, but can't match Lycos's online catalog.

$15 est. street price (trial issue); $9.95 per month
Frontier Technologies
(800) 929-3054, (414) 728-8200
Reader Service No. 686

Internet Mania

Usability ***

Verdict ***

Bargain utilities enhance surfing and offline searching.

$19 est. street price
Corel Corp.
(800) 772-6735, (613) 728-8200
Reader Service No. 687

WebCompass

Usability ***

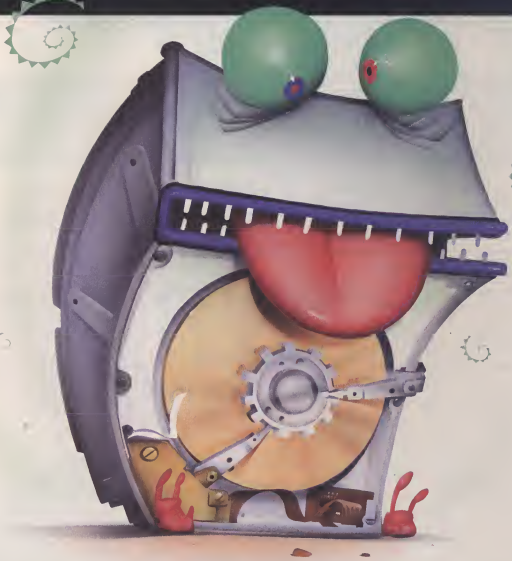
Verdict ****

The most comprehensive Web-search tool available.

$99 est. street price
Quarterdeck Corp.
(800) 683-6696, (310) 309-3700
Reader Service No. 688

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

IT'S WHAT KEEPS YOUR GIG DRIVE FROM GAGGING.



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Your Personal Investment Analyst

Buy! Sell! Hold! If you plan on making your first million in the stock market, the insight you have on your investments can make the difference between living on Park Avenue or on a park bench. Omega Research's Wall Street Analyst is an excellent low-cost package that helps you choose, track, and analyze stock investments, with information that you can update daily. While the interface is rather lean, the stock histories and information on the included CD make it well worth the price.

Insightful Investing Wall Street Analyst's main strength is supplying the stock-price history for the past 25 years of every company of every major exchange (NASDAQ, NYSE, Amex, Canadian, and so on)—all on one CD. It also supplies fundamental data, like total annual gross, volume sold, and amount of stock traded, for several of the larger, more popular public companies and commodities.

Tracking the history of a stock is simple. Pick from one of the thousand (either by symbol or company name), and a chart history of that stock pops up. While the chart may initially look like a crayon scribble, there are plenty of help files that explain common terms and concepts.

Once you know how a particular stock fluctuates, Wall Street Analyst goes a step further, using technical and fundamental analysis methods to help you decide where that stock is headed and whether you should invest in it. Finally, there are also plenty of charting tools to help you segment financial quarters, highlight highs and lows, trace any trends, and make notes.

Bullish Trading: Omega Research's Wall Street Analyst gives you basic forecasting features and 25 years' worth of daily price histories for every stock and commodity on the market.

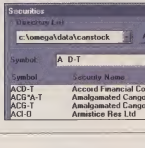
A. Skim stocks' **highs and lows** for the year.

B. **Fundamental data** is available for many stocks.

C. Track a stock's history using **charts and graphs.**

D. View hundreds of **analytical charts** with the click of a button.

Insider Information: The online service Dial/Data lets you download updated stock and company information daily for a small fee.



The software does have a few intentional limitations. For instance, Wall Street Analyst alerts you if a stock rises well above or below its average, but you can't change these settings to have it alert you of a specified value. If you want that feature (once you get rolling, you probably will), you'll need Omega's more advanced SuperCharts, or an equivalent product like Market Arts' Windows on Wall Street or Equis's MetaStock. All three cost more (between $250 and $350), and were designed for financial professionals. But if you're heavy into trading and have several stocks to track, they're worth it. Being able to set your own parameters on a stock's daily high or low is essential once you're familiar with its movement.

Raising the Stakes Beyond the interface quips, the only major problem with Wall Street is its lack of good reporting tools. All the information you track shows up on a line chart or text list, but there are no links to more information from these points. And there's no easy way to export a Wall Street graph to a spreadsheet, a presentation package, or financial software.

Whether you're a high roller or just monitoring your 401K, this is an outstanding package. The information on the CD is solid, daily online updates are affordable (beginning at $20 a month), and the price can't be beat. Although the interface is initially a pain and some important functions have been omitted, Wall Street Analyst is ideal for people who are just beginning or only dabbling in the stock market—on either a personal or small-business level. For serious trading, however, you'll need a more robust package. **JACK LYON**

FILEBOX

Wall Street Analyst

Usability	***
Performance	****
Verdict	****

An excellent way to track and analyze your stocks and investment assets.

Competition: Market Arts' Windows on Wall Street, Equis's MetaStock, and Omega's SuperCharts all track more stock information, provide more in-depth analysis, and supply several alert indicators. Designed for professionals, however, they're harder to use and cost several hundred dollars more.

System Requirements: Windows 3.1 or later, 386 CPU, 4MB of RAM, 20MB of hard disk space.

Optional Online Updates: Fresh stock information is provided by Dial/Data. Stock prices, fundamental data, and company profiles are updated daily. Fees vary, beginning with a $20 monthly base rate.

$50 est. street price
Omega Research
(800) 556-2022, (305) 270-1095
Reader Service No. 689

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

Introducing the first remote control solution to take full advantage of all the 32-bit power of Windows 95 and Windows NT. The new pcANYWHERE32™ combines remote control, file transfer and general communications so you'll have the fastest access to your remote PC, network servers, printers, applications and files.

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Circle 211 on reader service card.

Personal Web Publishers

SNEAK PREVIEW

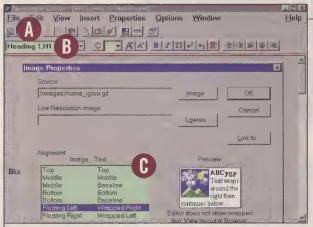
For HTML tools, last year was a banner year: They helped Web publishers get the job done. But for the most part, these tools, including MediaTech's Live Markup and Sausage Software's HotDog, offered limited features and cumbersome interfaces. As the next wave of Web-publishing tools hits the market, two products are surging ahead of the others: Netscape's Navigator 2.0 Gold and InContext's Spider 1.1.

Jump Start The strength of InContext's Spider lies in its commitment to Standard Generalized Markup Language (SGML), a superset of HTML. Spider ships with plenty of templates that help get you going, and the program offers considerable power.

Unlike other editors, Spider divides the screen into two regions—the Content Editor and the Logical Editor. The Content pane contains the actual contents of the HTML document, while the Logical Editor displays your document in graphical outline form. The two panes interact completely.

Spider takes some getting used to. But its built-in support for tables, forms, and many other HTML 3.0 and SGML features, plus the Logical Editor's help with outlining and organizing your Web pages, make it an editor to consider seriously. It also fully supports the special extensions (such as marquees) for Microsoft's Internet Explorer, and will soon begin shipping with a copy of Microsoft's browser.

Netscape's Navigator 2.0 Gold has been one of the most eagerly awaited software products of the year. Why? Because with Gold you can do your Web authoring in WYSIWYG fashion from within Navigator itself—you never have to leave the browser.

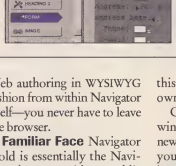


Publish or Perish: With new graphical Web-authoring tools like Netscape's Navigator 2.0 Gold and InContext's Spider 1.1, you can design a distinctive home page without memorizing HTML code.

A. Switch between **browsing and editing** with a single button click.

B. Insert common **HTML headings** and other elements.

C. Alignment is a simple menu choice in the Image Properties dialog box.



Free-form Editor: InContext's Spider lets you easily create Web forms for collecting information. It also supports tables and SGML.

Familiar Face Navigator Gold is essentially the Navigator browser with two additional menu items. But it's these two items that make all the difference. In the Window menu you'll find the Editor command, which launches an empty window you can use to create HTML documents from scratch. Perhaps more interesting is the File menu's Edit Document command, which opens the editing window complete with the page you're currently viewing. You can modify and supplement this page, and save it to your own hard drive.

Once the Edit Document window is open, you have a new set of menus and icons at your disposal. Many of the icons mimic those found in word processors (bold, italic, center, and so on), but some are HTML-specific, including font color, font size, superscript, and subscript. In the Styles drop-down menu you have easy access to heading levels and lists that are also found in the Properties/Paragraph menu.

An icon opens the Bookmark window, from which you can drag bookmarked sites to the Editor window, thereby creating instant hyperlinks. Another icon lets you control properties, while a third lets you access line features. Not surprisingly, Navigator Gold supports all Netscape extensions.

InContext's Spider and Netscape's Navigator Gold offer powerful HTML-only Web-publishing tools. If you're interested in different Web languages, such as Shockwave or Java, look elsewhere. Choose Spider if you're interested in publishing with SGML and if you need special extensions for other platforms, such as Microsoft's Internet Explorer. Choose Navigator 2.0 Gold if you prefer a power-packed editor and browser. NEIL RANDALL

FILEBOX

Navigator 2.0 Gold

Usability ****

Verdict ****

Powerful, all-in-one editor and browser uses the familiar Netscape interface.

System Requirements:
Windows 3.1 or later, 386 CPU, 4MB of RAM, 2MB of hard disk space. Support includes TCP/IP and WinSock.

$79 est. street price
Netscape Communications Corp.
(800) 638-7483, (415) 528-2555
Reader Service No. 690

Spider 1.1

Usability ***

Verdict ***

Graphical HTML and SGML editor has excellent outlining and forms features.

System Requirements:
Windows 3.1 or later, 386 CPU, 4MB of RAM, 7MB of hard disk space. Includes TCP/IP and WinSock support.

$79 est. street price
InContext Corp.
(800) 263-0127, (416) 922-0087
Reader Service No. 691

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

Finally, a multimedia notebook powerful enough to replace your desk top.

The Millennia TransPort

The Millennia TransPort™ from Micron bridges the performance gap between desktop and notebook computers. Feature for feature this notebook gives you everything you need—whether you're working on the road or at your desk. Moreover, it bears the Micron name; a name synonomous with award-winning technology and reliability.

Performance that will take you where you want to go! Start with blistering speed—133MHz Intel Pentium® processor—add 256KB of pipelined burst cache and 16MB EDO memory and you've got all the power you need to conceive and execute the most sophisticated multimedia presentation.

Designed to work the way you do. The Millennia TransPort's unique FlexOpt™ design gives you not one but *two* bays for a real choice of notebook configurations. Add an extra lithium-ion battery to get more working time. An extra hard drive so you can store even the biggest ideas. Or drop in the quad-speed CD-ROM drive and enter the exciting world of multimedia. The choice is yours. Modular components make configuring your notebook as quick and easy as turning on your computer.

Product protection that's second-to-none. Micron is so confident in the design and construction of the Millennia TransPort that it's offering an industry first—the Micron Power℠ warranty. It includes a five-year limited warranty on the microprocessor and main memory and a three-year limited parts-only system warranty.

Regardless of your destination, go with the notebook that outperforms the rest, the Millennia TransPort from Micron.

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http://www.mei.micron.com

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intel inside pentium

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4X Modular CD-ROM provides fast access to a whole new world of information.

Lithium-ion Battery Intelligent modular lithium-ion batteries give you the power to complete the job. Add a second modular battery in bay two and double your productivity.

Modular Bay #2:

Lithium-ion battery

or

4X CD-ROM drive

or

2nd 1.3GB hard drive

or

3.5" floppy disc drive

Dual Pointing Devices The Pick-a-Point™ offers two pointing devices; choose either the touchpad or the pointing stick.

Modular Bay #1:

Lithium-ion battery

or

3.5" floppy disc drive

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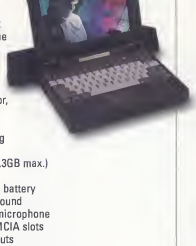

Common Features
- 133MHz or 120MHz Intel Pentium® processor
- Intel PCI mobile Triton chipset
- 256KB L2 pipelined burst cache
- EDD memory (48MB max.)
- 4X modular CD-ROM drive
- 11.3" SVGA color display, 800 x 600
- PCI 64-bit graphics accelerator, 1MB RAM
- Pick-a-Point™ dual pointing devices integrate both pointing stick and touchpad
- Removable EIDE hard drive (1.3GB max.)
- 3.5" modular floppy drive
- Intelligent modular lithium-ion battery
- SoundBlaster™ 16-bit stereo sound
- Built-in stereo speakers and microphone
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- Headphone, microphone and line-in jacks
- 2 infrared ports, one front, one back
- Parallel, serial, VGA and 2 PS/2 ports
- Dimensions: 11.7" x 9.4" x 2.0", Weight: 6.9 lbs.†
- Nylon carrying case
- Microsoft® Windows® 95 and MS Plus! Companion
- Microsoft Office Pro 95 and Bookshelf 95 CDs
- 5-year/3-year Micron Power™ limited warranty*

Micron Millennia TransPort P133
- Intel 133MHz Pentium processor
- 11.3" active matrix color display, 800 x 600
- 32MB EDD memory (48MB max.)
- 1.3GB removable hard drive
- 2nd intelligent modular lithium-ion battery
- Motorola® Montana 28.8 fax/modem

$5,799 Business lease: $190/month

- Intel 133MHz Pentium processor
- 11.3" active matrix color display, 800 x 600
- 16MB EDD memory (48MB max.)
- 1.3GB removable hard drive
- 2nd intelligent modular lithium-ion battery

$4,899 Business lease: $167/month

Micron Millennia TransPort P120
- Intel 120MHz Pentium processor
- 11.3" active matrix color display, 800 x 600
- 16MB EDD memory (48MB max.)
- 1.3GB removable hard drive

$4,499 Business lease: $153/month

- Intel 120MHz Pentium processor
- 11.3" dual scan color display, 800 x 600
- 16MB EDD memory (48MB max.)
- 810MB removable hard drive

$3,999 Business lease: $136/month

†6.9 lbs. includes 3.5" floppy and one battery.

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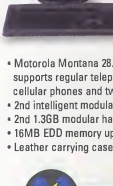

- **MicronExec™ desktop package** Matching black 17" monitor (15.8" display) Matching black mouse and keyboard (Can be used with or without MicronDock).....$799

- Motorola Montana 28.8 fax/modem supports regular telephone connections, cellular phones and two-way paging devices.....$299
- 2nd intelligent modular lithium-ion battery.....$199
- 2nd 1.3GB modular hard drive (2.6GB total).....$599
- 16MB EDD memory upgrade.....$699
- Leather carrying case upgrade..... $ 99

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- 3-year limited parts-only system warranty
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intel inside pentium

Build Better 32-Bit Apps

SNEAK PREVIEW

There are two ways to create custom Windows applications: hire a professional or do it yourself. The good news is that building your own apps is easier than you'd expect with new visual-programming tools like Borland's Delphi 2.0 and Microsoft's Visual Basic 4.0.

Microsoft spearheaded the concept of simple application-development programs with Visual Basic; version 4.0 brings these capabilities to Windows 95 and Windows NT. Borland's Delphi 2.0, meanwhile, offers all the 32-bit tools of Visual Basic, but is completely object-oriented, making it easier to reuse code across applications. While Visual Basic is the easier of the two to use, Delphi leads in performance and power. Both tools set new standards for 32-bit-application development.

Delphi 2.0 and Visual Basic 4.0 each are available in three editions: one for the occasional programmer, one for the workgroup developer, and one for the enterprise-wide programmer. The most advanced editions include version-control software and dozens of client-server tools.

Each application sports a visual interface with user-extendable palettes that have Windows 95 controls and the building blocks for creating OLE servers and clients. Visual Basic also supports menu negotiation in applications that allow OLE 2 in-place editing.

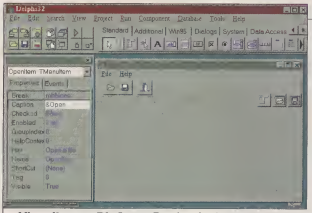
Recycled Code As similar as Delphi and Visual Basic are, they differ in how they reuse large chunks of code. Delphi uses Object Pascal—an object-oriented programming language. You can save these chunks of code as dynamic-link libraries (DLLs) or OLE custom controls (OCXs). The strength of Delphi's real-compiler approach is its support for any kind of threading.

Visual Basic, meanwhile, pushes its OLE-everywhere metaphor. The most efficient way to reuse code is to compile it as an OLE server. Unfortunately, you can't create your own OCXs with Visual Basic as you can with Delphi. Visual Basic doesn't have threads, either, although it does support background processing with a feature called Remote Automation.

Visual Basic and Delphi are both excellent products—choosing between them is not easy. For adding distributed processing to client-server applications, Visual Basic is the better choice. It's also the easier of the two tools for the occasional programmer to learn. Visual Basic hides a lot of the complication of Windows and OLE, so there's no need to track code variables.

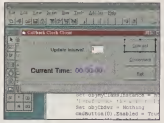
Delphi's full inheritance, meanwhile, lets you reuse and modify code in ways Visual Basic doesn't. However, it's difficult to learn Delphi's Object Pascal and its arcane programming concepts.

Ultimately, the choice comes down to Visual Basic's ease of use, versus Delphi's power. Either way, both products are indispensable tools for building 32-bit Windows applications. BARRY SIMON



Visualize 32-Bit Apps: For developing custom 32-bit applications for Windows 95 or Windows NT, you have two choices in visual-programming tools: Borland's Delphi 2.0 and Microsoft's Visual Basic 4.0. Visual Basic is easier to learn, but Delphi (shown above) offers more power and flexibility.

Network Control: Visual Basic's Enterprise Edition lets you create a program that reacts when called to a specific action on a remote server.



FILEBOX

Delphi 2.0

Usability	**
Performance	*****
Technology	****
Verdict	****

Difficult to learn, but it's the most powerful 32-bit programming tool you can buy.

System Requirements: Windows 95 or Windows NT, 386 CPU, 8MB of RAM, 35MB of hard disk space, CD-ROM drive.

Versions Available: The Desktop Edition includes the basic compiler and several components; the Developer Edition adds a database engine and Report Smith; the Client-Server Suite has version control and client-server tools.

$199 est. street price for Desktop Edition; $299 for Developer Edition; $1,999 for Client-Server Borland Int'l
(800) 331-0877, (408) 461-9195
Reader Service No. 692

Visual Basic 4.0

Usability	***
Performance	****
Technology	*****
Verdict	****

The easiest 32-bit tool for the occasional programmer—but novices, beware.

System Requirements: Windows 95 or Windows NT (for the 32-bit version), 486 CPU, 8MB of RAM (16MB of RAM for Windows NT), 20MB to 80MB of hard disk space, CD-ROM drive.

Versions Available: The Standard Edition has a basic compiler and controls; the Professional Edition adds a database engine and client-server drivers; the Enterprise Edition includes version control and Remote Automation.

$99 est. street price for Standard Edition; $499 for Professional Edition; $999 for Enterprise Edition
Microsoft Corp.
(800) 426-9400, (206) 882-8080
Reader Service No. 693

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

New! SOFTWARE: Quarterdeck MagnaRAM 2

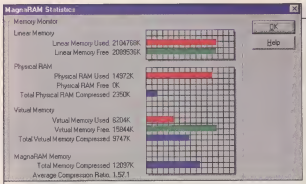
Improve Your Memory Mileage

Clamoring for a memory boost now that you've upgraded to Windows 95? Most RAM doublers work only with Windows 3.1, but Quarterdeck's MagnaRAM 2 is the first and only utility to successfully tackle memory constraints on PCs running Windows 95.

Like all RAM-doubling utilities, MagnaRAM 2 compresses active data in memory. Application files don't compress well, so you can't run more applications. But data files are another story. Large-image, database, and spreadsheet files compress well, and that's where you'll see a difference. In our tests, we were able to open twice as many files on a system loaded with MagnaRAM 2.

MagnaRAM 2 also reworks part of your swap file into active memory, which theoretically speeds system performance. In our tests, however, the performance boost was minimal, and machines that had only 4MB of RAM actually slowed down.

No software can completely replace the need for adding memory chips to your system. Memory-hungry apps such as Adobe's PageMaker, which uses lots of RAM to load large graphics files, won't accept RAM substitutes. But if you're running Windows 95 with 8MB of RAM, you'll be able to load more files using MagnaRAM 2. And at under $40, MagnaRAM 2 is much cheaper than a $400 8MB memory upgrade. JACK LYON



32-Bit Memory Master: MagnaRAM 2 gives you more from your memory by compressing active data. The payoff? You can open more files at a time.

FILEBOX

MagnaRAM 2

Usability ****
Technology ****
Verdict ****

Stretch your RAM and open more files under Windows 95.

Competition: None—MagnaRAM 2 is the first for Windows 95.

System Requirements: Windows 95, 386 CPU, 4MB of RAM, 2MB of hard disk space.

$39 est. street price
Quarterdeck Corp.
(800) 683-6696, (310) 309-3700
Reader Service No. 616

GoldMine for Windows 95

Contact Management Meets the Net

SNEAK PREVIEW

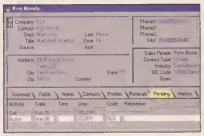
Imagine being able to pull your appointments straight off the Internet. You would save time and money, and avoid the hassles of a dial-in network. That's what you get with GoldMine for Windows 95—in addition to database synchronization, e-mail, and a new pager technology, all through the Internet.

Beyond e-mail and network packages, contact managers are the fundamental workgroup applications, but you often lose speed and program features when you try to access them remotely. With GoldMine's Internet integration, those problems are solved.

GoldMine offers more team-player functions than many applications do: You get scheduling features, database management, remote synchronization, e-mail, phone messaging, sales automation, and comprehensive network history tracking. The InfoCenter, a new feature, acts as a repository for any documents you want to share.

Novices haven't been left out either. There are several wizards that walk you through more tricky maneuvers like performing a global search and replace or importing and exporting documents.

GoldMine isn't a simple calendar or PIM; it's a little more expensive than either, and built for sharing information on many levels. With the new version taking advantage of the Net's availability, speed, and low cost, it's ideal if your team needs the ultimate in communication and information sharing. JAMES OLIVER CURY



Be a Team Player: GoldMine for Windows 95 lets you update and share information via the Internet.

FILEBOX

GoldMine for Windows 95

Usability *****
Technology ****
Verdict ****

The best workgroup contact manager with Internet and pager integration.

Competition: Symantec's Act is the market leader for solo users. NetManage's Ecco Pro 3.0 offers a networkable contact manager that ties into Web sites, but doesn't provide Internet-based workgroup connectivity.

System Requirements: Windows 95, 486 CPU, 4MB of RAM, 6MB of hard disk space.

$295 list
GoldMine Software
(800) 654-3526, (310) 454-6800
Reader Service No. 617

Guide to the Ratings: *****Excellent ****Good ***Acceptable **Poor *Unacceptable

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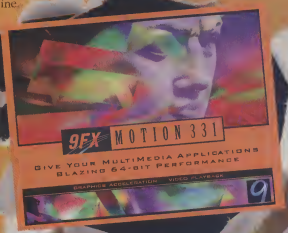

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Cheyenne FaxServe 3.01 for NetWare

Serving Faxes on the Network

Does your office's fax machine look like a paper recycling bin? Do you spend too much time feeding the fax machine? If so, here's a better alternative: Cheyenne's FaxServe 3.01 for NetWare lets anyone on a NetWare network skip the paper process by sending and receiving faxes electronically.

Serve It Up FaxServe's software is compatible with just about any fax modem and supports a variety of popular e-mail systems and databases, as well as NetWare Directory Services (NDS) technology. NDS allows for easy, object-oriented administration of network rights, permissions, and configurations.

For anyone connected to the network, FaxServe is a no-brainer. As with stand-alone personal fax packages, you select the document you want to fax and it's translated to an electronic format. The electronic fax is then sent to the FaxServe server, which sends the file at a time you designate. No more waiting in line at the office fax machine.

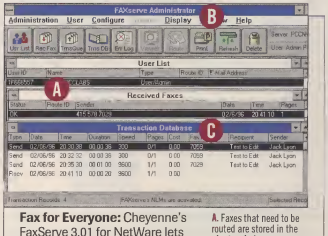
Receiving faxes is equally simple: They show up in your e-mail in-box. Simply double-click on an entry to view the faxed image. You can print faxes or save them for later reference. You can even pop fax files into your favorite OCR package, where they can be translated to editable text. FaxServe works with most major e-mail packages, including Lotus's cc:Mail and Microsoft's Mail.

Awkward Routing FaxServe has one of the best administration modules we've seen, but routing faxes is a hassle. Unless each person on the network has his or her own fax line, there's no simple, hands-free way to distribute faxes. However, a few complex methods have been created to automate the process. One popular way is with an OCR utility that attempts to read who the fax is meant for and then automatically send it to that person via e-mail. Another involves assigning to each fax mailbox a two-digit extension that the sender must type in once a fax connection is established. However, both of these methods are far from perfect. As with most other fax-server products, the most effective way to route faxes is to have someone open each one, figure out who it's for, and forward it manually.

FaxServe's closest competitor, RightFax 4.0, costs twice as much. Its chief advantage is that one license covers an unlimited number of users under either Windows NT or OS/2; FaxServe works only on networks running NetWare 3.12 or later.

FaxServe is also pricey, particularly for small workgroups. The software itself is reasonable at $595 for a five-user license, but you'll need to buy a multiline network fax modem, such as GammaLink's GammaFax, to handle the sending and receiving. Modest multiline server prices start at around $1,400—if you already have a server, that is.

FaxServe isn't the last word in fax management. But if most of your office's outgoing faxes are created by computer, or you're looking for a way to avoid the paper pileup at the company fax machine, FaxServe is a fine solution. JACK LYON

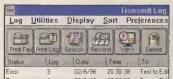


Fax for Everyone: Cheyenne's FaxServe 3.01 for NetWare lets anyone on a NetWare network send and receive faxes electronically. The software works with most fax modems, databases, and e-mail packages.

A. Faxes that need to be routed are stored in the **electronic hopper.**

B. The **Administrator** lets you quickly view all fax clients on the network.

C. Track faxes with the **Transaction Database.**



Quick Tricks: FaxServe includes several tools for searching, broadcasting, and managing incoming and outgoing faxes.

FILEBOX

FaxServe 3.01 for NetWare

Usability ***
Technology ****
Verdict ****

Simple, paperless faxing over a NetWare network.

Competition: RightFax 4.0 is the only other software package that supports multiple phone-line routing. It costs twice as much as FaxServe's five-user pack, but it supports unlimited users and is the only fax server that supports Windows NT.

Features: FaxServe works with most MHS-, VIM-, and MAPI-based e-mail apps. Multiple files can be attached in their original formats. It supports 32 phone lines and includes automatic redial, customizable cover pages, and broadcast faxing.

System Requirements: For server, Windows 3.1 or later, 8MB of RAM for NetWare 3.12, 16MB of RAM for NetWare 4.1. For client, Windows 3.1, 386 CPU, 8.1MB of hard disk space.

$595 est. street price
Cheyenne Software
(800) 243-9462, (516) 484-5110
Reader Service No. 694

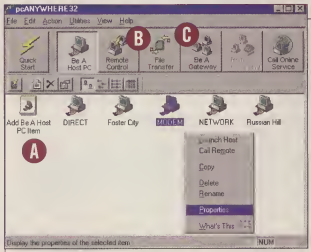
Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

Dial Up Your Desktop

SNEAK PREVIEW

You survived the hellish commute home only to discover that you left an important file on your desktop system at work. Migraine? No way. Just grab the file remotely. Two new remote-control packages, Symantec's Norton pcAnywhere32 and Traveling Software's LapLink for Windows 95, let you dial into your office PC from wherever you are and copy the files you left behind. They also let you check your e-mail, run applications remotely, log onto the network, and print to a networked printer.

While the basic remote functions built into Windows 95 (like dial-up networking) will do the job for simple file retrieval, consider pcAnywhere32 or LapLink if you need the power to control and synchronize files and access network peripherals and applications. Of the two programs, pcAnywhere32 is the simpler option and the only one that also runs on Windows NT, but LapLink lets multiple systems connect to the same host PC on a network.

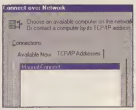


Dial-in Deliverables: Remote-control products like Norton pcAnywhere32 (above) and LapLink for Windows 95 let you access applications, files, e-mail, and printers from afar. The newest versions let you connect to a variety of operating systems.

A. Norton pcAnywhere32 lets you add different **host configurations** quickly and easily.

B. Dial up any host PC via a remote PC.

C. Your PC can also act as a **network gateway.**



Long Distance: Traveling Software's LapLink for Windows 95 lets you have as many as 11 connections at the same time—and offers a wireless option.

Access Anywhere From the beginning, pcAnywhere32 is hassle free. It comes equipped with a series of step-by-step Quick Start Wizards to help get you connected via an analog modem or a number of different network options, including IPX, SPX, NetBIOS, and TCP/IP. Direct cable connections can also be set up through serial or parallel ports.

Once you've set up pcAnywhere32, you have several options. Remote Control lets you control a host PC; File Transfer moves files from one place to another; and Be a Gateway lets pcAnywhere32 clients reach your network.

Other enhancements to pcAnywhere32 include TAPI modem support, interface improvements, and SpeedSend, a new feature that improves file-transfer performance by comparing the contents of two files and transferring only the new data. Because pcAnywhere32 can maintain only one connection at a time, it's a good choice for stand-alone use.

Multiple Connections Traveling Software's LapLink delivers much of the same power as pcAnywhere32. But although LapLink includes help files to get you started, they are not as useful as the step-by-step wizards in pcAnywhere32.

LapLink offers several unique features, including the benefit of up to 11 simultaneous connections. Multiple connections are especially useful for network-systems managers who juggle technical-support and help-desk duties for several employees. LapLink also supports wireless connections in addition to the same laundry list of connection options offered by pcAnywhere32. And while LapLink doesn't support Windows NT, this version of LapLink does come with a 16-bit Windows 3.1 option.

For the most part, you'll find similar features in Symantec's Norton pcAnywhere32 and Traveling Software's LapLink. We liked the setup, wizards, and interface of pcAnywhere32—it's a great choice for stand-alone users. LapLink is the best choice if you need a wireless remote-control option, as well as support for several simultaneous connections. RICH SCHWERIN

FILEBOX

LapLink for Windows 95

Usability ****
Technology ****
Verdict ****

A must for multiple users, with 11 simultaneous connections and wireless support.

Competition: Norton pcAnywhere32 offers a slightly simpler interface, but can't match LapLink's multiple, simultaneous connections or wireless support.

$149 est. street price
Traveling Software
(800) 343-8080, (206) 483-8088
Reader Service No. 695

Norton pcAnywhere32

Usability *****
Technology ****
Verdict ****

Smart wizards make it easy to reach your desktop from afar.

Competition: LapLink is the only other package that's Windows 95–compatible. It offers similar features and performance, and adds multiple connection features and wireless support.

$149 est. street price
Symantec Corp.
(800) 441-7234, (408) 253-9600
Reader Service No. 696

Guide to the Ratings: ***** *Excellent* **** *Good* *** *Acceptable* ** *Poor* * *Unacceptable*

The Techies Want Performance.

Multi-talented. A brilliant addition. Magnavox monitors offer resolutions up to 1600 X 1280, refresh rates over 100Hz and a 0.28mm dot pitch for sharp, vibrant color and flicker-free images.

The Number Crunchers Want Affordability.

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Windows 95 Undocumented SECRETS

Psssst! Want to learn the real insider secrets about Windows 95? The ones Microsoft forgot to mention—or didn't want you to hear? *PC Computing*'s Windows 95 expert Ed Bott has uncovered ten of the best undocumented tips and tricks to kick your productivity into high gear. Whether you're looking for ways to shave a few minutes off your everyday tasks, new techniques to manage your files, or interface tweaks to customize your system, we have the secrets and shortcuts you need to know. And you won't find them anywhere else. If you're ready for more than the Windows 95 basics, you'll find it here.

BY ED BOTT

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Fast Files: Two Clicks to a New Document

Don't you hate wandering through cascading menus, and then waiting for the right application to open when you want to create a new document? Speed things up using the New option in Windows 95's handy right-mouse-button menu. Just point to the desktop, right-click, and choose a document type. You can rename the new document, and then double-click to get down to business.

A fair number of Windows applications add their own generic entries to the New menu. But you can be far more productive if you fine-tune that list to include the document types you use most often—letters, reports, memos, and so on. And you can do exactly that if you're willing to open the Windows Registry Editor and make a few simple changes. Here's how:

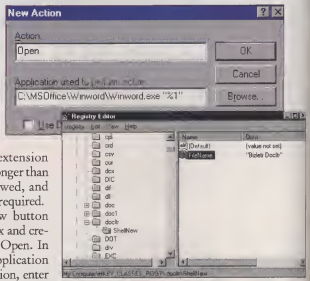
Step 1: Tell Windows how to create the new file type. Windows 95 uses a database of named file types and associated extensions to track the relationship between files and applications. The first step is to create a new Windows 95 file type with a descriptive, plain-English name, such as Business Letter or Interoffice Memo.

Open any folder window (My Computer will do), then choose View, Options, and finally click on the File Types tab.

Click on the New Type button and fill in the blanks for the Description (Business Letter) and the associated extension (Doclltr). Extensions longer than three letters are allowed, and capital letters are not required.

Click on the New button under the Actions box and create an Action called Open. In the box labeled Application Used to Perform Action, enter the name and the full path to the application you'll use to create the new file, followed by a space and the entry "%1" (be sure to include the quotation marks or you'll get an error message when you try to create a new file). Click on OK, then click on Close to add the new file type.

Step 2: Create a template document. Windows can automatically include boilerplate text and special formatting each time you create a new document. For example, a business letter can include a letterhead graphic, return address, and signature block. To create a template document, use the application specified in the File Type dialog box. Save the file in the C:\Windows\ShellNew folder, using a simple DOS filename of eight characters or fewer (like Bizletr), followed by a period and the extension you just created, all enclosed in quotes. In this example, the full filename would be "C:\Windows\ShellNew\Bizletr.Doclltr".



Right Mouse-Button: Get easy access to the document types you use most frequently.

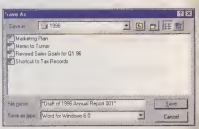
Step 3: Add the file type to the Windows right-mouse-button menu. You'll need to add two entries to the Windows Registry using the Registry Editor. Click on the Start button, choose Run, type Regedit, and click on OK. After the Registry Editor opens, press Ctrl-F and search for the file extension you just created—in this case, Doclltr. You'll find a folder entry under the heading HKEY_CLASSES_ROOT. Select the entry, click the right mouse-button, and choose New Key. Replace the generic key name (New Key #1) with ShellNew, then select that key and right-click in the right-hand panel. Next, choose New String Value and name the entry FileName. Then right-click on that entry, choose Modify, and type the name of the template file in the ShellNew folder. Lastly, close the Registry Editor.

You can now right-click on any empty space on the desktop or in a folder, choose New, then Business Letter, and a fresh copy of the template document will instantly appear. Double-click on that icon to get right to work. To remove an item from the New menu, use the Registry Editor to delete the ShellNew entry associated with that file extension.

QUICK TIP: EXTENSIONS

Name It Your Way

An ever-growing number of Windows applications—including the latest versions of Microsoft's Word and Excel, as well as Windows 95's built-in WordPad utility—insist on tacking their own reserved extension onto your filename, even if you'd rather use another extension. Even worse, because Windows 95's long filenames allow as many periods as you like, you can wind up with an ungainly filename like Letter.New.Doc. The solution: When you use a common dialog box, enclose the filename (including the extension and full path, if necessary) in quotation marks.



Any File Extension: To use your own, enter filenames in quotes.

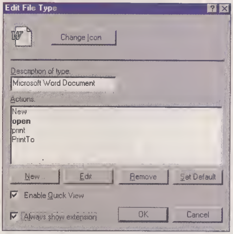
Extensions: Keep 'Em in Plain Sight

Someone please send this message to Redmond, Washington: The world is switching to Windows 95 at its own leisurely pace. When your Windows 95 filenames collide with the older, eight-dot-three variety on the server down the hall, it can get messy. Here's one workaround and one big caution:

Turn Extensions On, Selectively During the eight-dot-three era, some businesses (including *PC Computing*) standardized on file-naming schemes that use three-letter file extensions. You can still use these schemes under Windows 95 without being forced to look at every extension on every file. Just open a folder window, choose View and Options, click on the File Types tab, and make sure that each agreed-upon extension is associated with a file type. Then highlight the file type, click on the Edit button, and make sure the Always Show Extension box is checked. Now you can save Word documents with the extension LTR without forfeiting the right to change your mind (and the file's extension) at a later time.

Don't Mess with Those Tails! Pore through the Windows Resource Kit and you'll discover a Registry setting that lets you turn off the numeric tails (~1, ~2, and so on) that Windows 95 tacks onto the end of filenames. (To turn them off, add the value NameNumericTail = 0 in the following Registry key: Hkey_Local_Machine\System\Current ControlSet\Control\FileSystem.)

Heed our warning: Leave this setting alone. A surprising number of Windows applications become hopelessly confused when numeric tails have been turned off. For example, many Windows accessories contain hardwired registry entries that point to the \Progra~1 folder instead of the \Program Files folder. If you make a change, you'll wind up with applets that don't work properly.

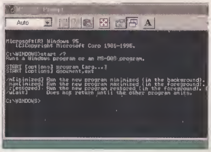


Filename Flexibility: Check Always Show Extension to edit an extension later.

Windows: Open in Bunches

Microsoft ditched the Windows Recorder with Windows 95, admitting that it was used only by an obsessive-compulsive minority. There's no replacement for it, but a single new MS-DOS batch-file command lets you open a group of folders or applications (both DOS and Windows) simultaneously. It's an acceptable workaround if you regularly store files in several directories or work with a suite of applications. Attach a DOS batch command to a Windows 95 icon and double-click on it to open 2, 3, or 100 folders at a time.

Use the Start command in DOS batch files to open folders and optionally to run applications. A handful of switches let you run application windows minimized (/m), maximized (/max), or restored to a normal window (/r, the default setting). For example, the following batch file opens a local folder and a network folder on the Acctg file server, minimizes both, then opens Notepad as well.



New Tricks for Old DOS: Open folder windows with this batch file.

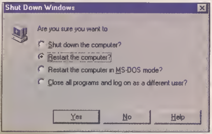
```
Start /m C:\Data
Start /m \\Acctg\Data
Notepad
```

Note that the Start command isn't necessary to launch Notepad, but it is required in batch files for folders. Also, be sure to right-click on the icon for the batch file and check the Close on Exit box on its Properties sheet. But there's no way to size the windows or position them onscreen. For that, you'll have to wait for Windows 97.

QUICK TIP: SHUTDOWN

Faster Restart

Testing minor configuration changes that require restarting Windows can take a minute or more on each boot cycle—and who wants to wait? An undocumented feature lets you restart Windows 95 without rebooting the computer, saving 20 to 30 seconds each time. From the Start Menu, choose Shut Down, select Restart the Computer from the dialog box, then hold the Shift key as you click on Yes. Instead of rebooting, Windows simply exits to real mode and restarts.



Restart sans Reboot: Hold Shift while you click on Yes to restart Windows 95.

SendTo: Great Places to Send Files

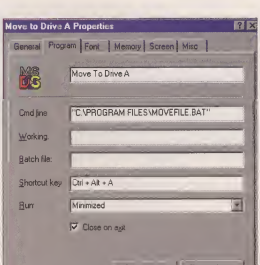
SendTo is one of Windows 95's most significant achievements in usability. By default, the right-button context menu includes a few folders, disks, and printers to which you can move or copy files. But it doesn't end there—you can add any application or folder to the Send To menu just by opening the SendTo folder and creating a shortcut. When you use the Send To menu, your actions follow the same rules as when you drag files from one place to another. Sending an executable file creates a shortcut. For other types of files, if the source and destination folders are on the same drive, the file moves from one place to another. Otherwise, you'll get a copy of the original. Here are three great destinations to add:

Your Own Desktop The Windows 95 desktop is just another folder, so add it to the Send To menu. Create a shortcut for C:\Windows\Desktop, call it My Desktop, and move it to the SendTo folder. Now, whenever you right-click on a file, My Desktop will be one of the choices on the Send To cascading menu. This way you can move data files from any number of folders—one, two, or a dozen at a time—directly to the desktop for quick access. To leave the original files in place, right-drag them to an empty space in the folder in which they're stored, then choose Create Shortcut from the pop-up menu. Now send the shortcut—not the original—to the desktop.

Someone Else's Desktop Who needs e-mail? If peer sharing is enabled on two machines, you can zip files and messages directly from one PC to another with the help of the Send To menu. For example, you could create a shortcut in your SendTo folder for the desktop folder on your coworker Ed's PC: \\Ed\Share_c\Windows\Desktop. If Ed is sharing his Desktop folder with you, you can drop any file directly on his desktop, just as you would leave a paper memo in his in-basket. This option always sends a copy of the current file, not the original. To avoid the confusion that comes when you have two copies of the file, first create a shortcut to the file, give it an attention-getting name, and send the shortcut to Ed's Desktop. Windows 95 will correctly rework the local path reference in the shortcut to the proper network syntax.

DOS (Yes, DOS) Batch Files DOS is *not* dead. Any DOS batch file with a replaceable parameter (%1) can act as a Send To destination. The batch file substitutes the highlighted filename for the replaceable parameter, just as if you had typed it at the command line. It's not just an idle exercise, either; DOS batch files can still do things that Windows can't. For example, to guarantee that a file will be moved rather than copied when you send it to a folder on a floppy disk or file server, put the replaceable parameter in a batch file: MOVE "%1" A:\ (be sure to include the quotation marks or the batch file will choke on any filename that contains a space). Create a shortcut to the batch file in your SendTo folder, naming it Move to Floppy. To copy a file to the floppy disk in the A: drive, use the icon that's already there. But to physically move a file onto that floppy, use this shortcut.

A word of caution: You must close an inactive DOS window every time you use this batch file, unless you set it to close when it has finished running. Right-click on the batch file and choose Properties. On the Program tab, check the Close on Exit box. Use the other choices on that tab to assign a global shortcut key to the batch file, or to run it minimized so it's even less obtrusive.

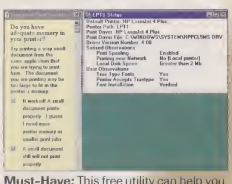


DOS as a SendTo Destination: DOS batch files do their thing and then disappear gracefully if you've set the Run (to Minimized) and Close on Exit properties correctly.

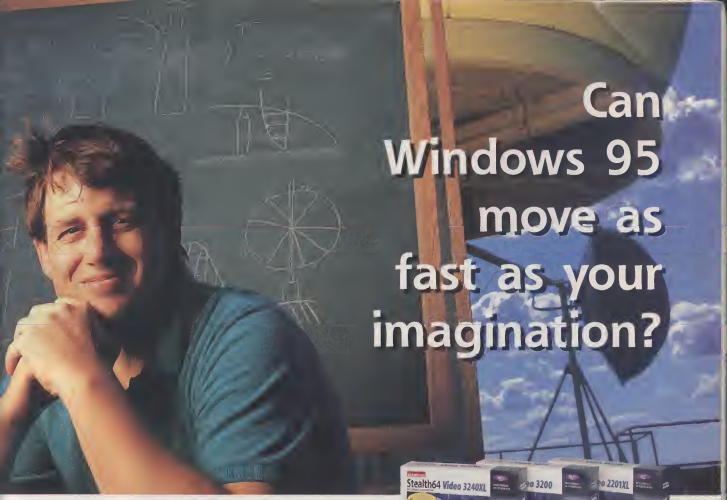
QUICK TIP: COOL STUFF

Free Utilities!

There's treasure buried in the Windows 95 CD—along with a few land mines. A must-install is the Enhanced Print Troubleshooter from the Other\Misc\Epts folder. Copy the entire folder (five files) to your hard drive and double-click on epts.exe to track down almost any printer problem. Also worthwhile is the Word Viewer, which lets you read, copy, and print files created in any version of Microsoft Word for Windows, without demanding that you own Word. To install it, run Setup from the Other\Wordview folder. Sidestep the Eru and Cfgback folders, though: Despite their appealing names, the Emergency Recovery Utility and Configuration Backup Utility aren't polished enough for us to recommend them.



Must-Have: This free utility can help you track down any printer problem.



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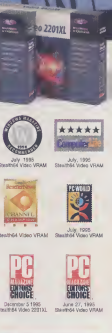

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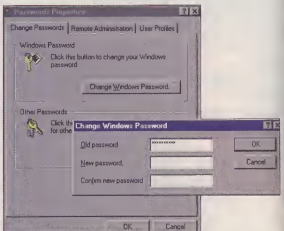
Password: Lightning-Fast Log-ins

Whenever you log in to Windows 95, it asks for a name and password. That means you can expect your system to be somewhat secure, right? Wrong. The default Windows 95 log-in box does only two things: It tells Windows which user-profile settings to load (assuming you've turned on that feature), and it unlocks the encrypted file that contains the rest of your passwords, like the ones you use to open your Exchange Inbox, connect to a NetWare or Windows NT network, or log on to your dial-up Internet account.

In an office where security could be an issue, locking that password file is a way to keep nontechnical coworkers from sending e-mail in your name. If you're concerned about password security, download the beefed-up password-caching DLL from Microsoft (http://www.microsoft.com/windows/download/mspwlupd.exe). On home PCs, however, that dialog box just slows down the boot-up process. To get rid of it, click on the Passwords icon in Control Panel, then click on the change Windows Password button. Enter your old password, but leave the space for a new password completely blank. Click on OK to close the dialog box. If you're connected to a network, this is a good time to right-click on Network Neighborhood, choose Properties, and make sure that Windows Logon is selected as the Primary Network Logon.



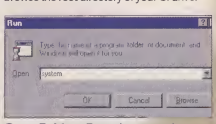
Banish the Box: Replace your password with a blank value to skip the log-in step.

An easy way to ensure security for your other passwords is to open the Windows folder, search for a file with the extension PWL, and delete it. When you're prompted to enter each new password, make sure the Save Password box remains unchecked.

QUICK TIP: FOLDERS

Run, Faster

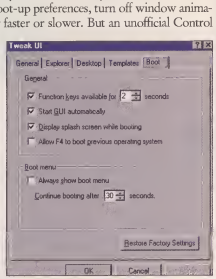
Want a quick way to open folders fast? Use the Run dialog box. For most local files, you need the full DOS path, but you can skip that step when opening a folder under the Windows hierarchy. Open the Send To, System, or Start Menu folder, for example, by typing just the name in the Run dialog box. (Use quotation marks if the name includes a space.) To instantly open a folder view of everything on the desktop, open the Run dialog box and type Desktop. Type \ to browse the root directory of your C: drive.



Open Folders Fast: Just type the folder name in the Run dialog box.

Interface: The Missing Pieces

In its rush to push Windows 95 out the door last August, Microsoft left out ways to adjust a few interface preferences. With the shrink-wrapped Windows 95, you need to go splunking in the Registry to clear the Recycle Bin and Network Neighborhood off the desktop, reset boot-up preferences, turn off window animations, or make cascading menus appear faster or slower. But an unofficial Control Panel applet called Tweak UI, included in a collection of utilities called Power Toys, lets you tinker with these features and many more aspects of the Windows 95 user interface. There's plenty more in the Power Toys file, including a quick resolution-switching utility and a pop-up player for audio CDs. Although Tweak UI was written by members of Microsoft's Windows 95 development team, Microsoft does not officially support it. But even with that caveat, Tweak UI is worth it. To get it, look in PC Contact, the Microsoft Network, or our Web site (see instructions on page 32), or point your Web browser to http://www.microsoft.com/windows/software/powertoy.exe.



Tweak UI: This applet is the place to get smooth control of menus and more.

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MAG INNOVISION

Desktop Supersystems

SYNOPSIS

HOW THEY WORK: *Running Windows 95? Get a plain-Jane Pentium or Cyrix 6x86 system. Running NT? Get a Pentium Pro. Here's why.* **136**

THE FASTEST PENTIUMS: *The top eight 150MHz and 166MHz desktop Pentium PCs.* **138**

LIFE AT 200MHz: *The first 150MHz and 200MHz Pentium Pros are here.* **146**

FINAL ANALYSIS: *Pentium or Pentium Pro? Choose the desktop supersystem that's right for you.* **154**

Count the times in your career you've settled for a slower but cheaper system, only to regret your frugality six months later. Once? Twice? With every PC purchase? Don't let it happen again. With today's bargain system prices, there's no reason to corner yourself into obsolescence. But given the bewildering array of processor options on the market, how do you know which of the systems is the fastest?

Good question. Chip makers haven't exactly eased the confusion. Intel, for instance, first positioned the Pentium Pro exclusively as a server CPU, but it arrived on the market as a desktop CPU—in some cases with dual processors. Now Pentium Pro servers are finally beginning to appear. Is Intel trying to kill off the Pentium already?

No. The Pentium is still Intel's best CPU for Windows 3.x and Windows 95. The Pentium Pro actually runs some 16-bit code *slower* than a plain-vanilla Pentium does. But with true 32-bit code—the meat of Windows NT applications—the Pentium Pro leaves the Pentium in the dust. The fact is, the Pentium Pro owns Windows NT, whereas the Pentium is the ticket for Windows 95. But while this is true today, it won't stay this way forever. Intel is already tuning the Pentium Pro to run 16-bit code faster; that version of the CPU should be available early next year.

Intel isn't your only option. Cyrix's long-awaited and just-released 6x86 CPU shows tremendous potential to turn up the heat on Intel. (Competitor AMD, on the other hand, can't seem to get its much-touted K5 chip out the door.) *PC Computing*'s Labs secured an early Cyrix 6x86 system to test whether it lives up to expectations (see "MicroFlex-686/100," on page 144).

Meanwhile, to help you sort through the hype and find the best systems currently available, we sent eight Pentium PCs and five

A PENTIUM POWER: Dell's Dimension XPS P166c was one of the fastest Pentium systems we tested. It comes with Number Nine's 4MB Imagine128 video card and Creative Labs' Sound Blaster AWE32 sound card.

B FASTEST PC: Among the first 200MHz Pentium Pro PCs, Dell's Dimension XPS Pro200 screamed by our 150MHz systems. Aided by Number Nine's 4MB Imagine128 video card and Seagate's 2.1GB hard drive, it outperformed a 133MHz Pentium system by more than two to one.

PHOTOGRAPHS BY ERNIE FRIEDLANDER

BY MARTY JEROME AND MARTY BEAUDET

New 166MHz and 200MHz PCs change the landscape of Windows computing.

first-generation Pentium Pro systems to *PC Computing*'s Labs for performance testing. Four of each type of system had clock speeds of 150MHz. The other four Pentiums ran at 166MHz, while one Pentium Pro—from Dell—ran at a breathtaking 200MHz. Our mission was to identify the fastest systems and determine which ones offer the best price-performance combination.

Real-World Performance Rather than run benchmarks that gauge only potential performance, we put these systems through real-world application tests to show you what you can expect. We tested each class of CPU running the operating system and applications for which it is best suited: Windows 95 for Pentiums and Windows NT for Pentium Pros.

Finding the best performance for your dollar can be tricky. Clock speed offers little indication of actual performance. Two 150MHz Pentium systems—Zenith's Z-Station GT Pentium 150 and USA Flex's Pentium 150MHz Multimedia System—ran slower than our baseline system, Micron's P133 Millennia. And the fastest 166MHz Pentiums performed less than 25 percent faster than the baseline 133MHz system.

Performance differences between Pentium Pro systems were greater, but again, clock speed gave few clues to real performance. NEC's 150MHz PowerMate Pro150, for example, was 21 percent slower than Dell's 200MHz Dimension XPS Pro200. Yet the PowerMate Pro150 was 36 percent faster than Gateway 2000's G6-150—which also runs at 150MHz.

Adding It All Up Prices also vary widely, especially across chip families. This is partly because Pentium Pros are typically stocked with 32MB of RAM—twice that in most Pentiums. Also, Intel's PCI chip set, used in most Pentium Pros, can't use EDO RAM to boost performance. Instead, some Pentium Pros use higher-priced custom memory technologies.

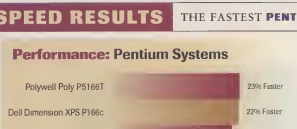
Further adding to the Pentium Pros systems' costs are larger hard-drive capacities. While the Pentium systems feature Quantum and Western Digital drives ranging from 1GB to 1.6GB, the Pentium Pros favor larger 2GB drives.

The video cards in most of the systems we tested are Diamond's Stealth 64, with 2MB of RAM; Matrox's MGA Millennium, stocked with either 2MB or 4MB of RAM; or Number Nine's faster Imagine128 card, with 4MB of RAM.

The cost of these components adds up. You can buy a 150MHz Pentium configured with 16MB of RAM, a 1GB hard drive, and a quad-speed CD-ROM drive for just over $3,000. Pentium Pros running at 150MHz, but loaded with 32MB of RAM, a 2GB hard drive, and a quad-speed CD-ROM drive begin in the $5,000 to $6,000 ballpark and rise steeply. This is the price of speed for true 32-bit performance.

SPEED RESULTS THE FASTEST PENTIUM AND PENTIUM PRO PCs

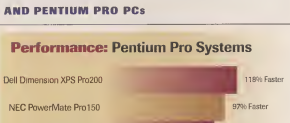
Performance: Pentium Systems



*150MHz PENTIUM PRO SHOWN FOR COMPARISON
NOTE: THE WINSTONE 96 BENCHMARK RUNS 13 OF THE MOST POPULAR WINDOWS BUSINESS APPLICATIONS.

Some Surprises: Two 150MHz Pentium systems outperformed a 166MHz PC, while two lagged behind the 133MHz baseline unit. Five of the eight Pentiums outscored even Micron's 150MHz Pentium Pro.

Performance: Pentium Pro Systems



NOTE: PERFORMANCE SCORES BASED ON 32-BIT GRAPHICS APPLICATIONS RUNNING UNDER WINDOWS NT 3.51

The Next Generation: While all of the Pentium Pro systems showed substantial gains over our 133MHz baseline system (Micron's P133 Millennia) when running 32-bit applications under Windows NT 3.51, the performance of Dell's 200MHz Dimension XPS Pro200 was exceptional—more than double that of the 133MHz Pentium. Among the 150MHz Pentium Pros, NEC's top-ranked PowerMate Pro150 bested its nearest competitor, HP's Vectra XU 6/150, by a respectable margin. Micron's Pro 150 Magnum was a close third, but Gateway's G6-150 lagged behind.

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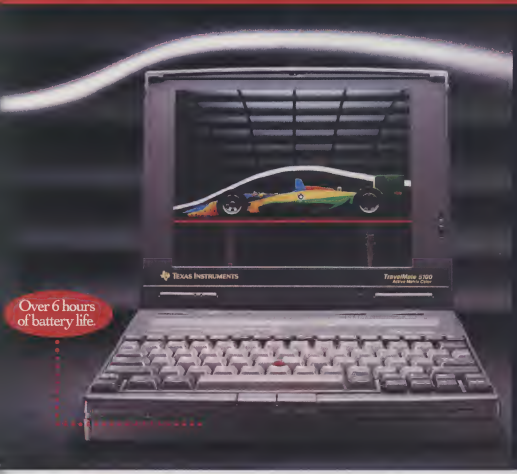

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intel inside pentium processor

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TEXAS INSTRUMENTS

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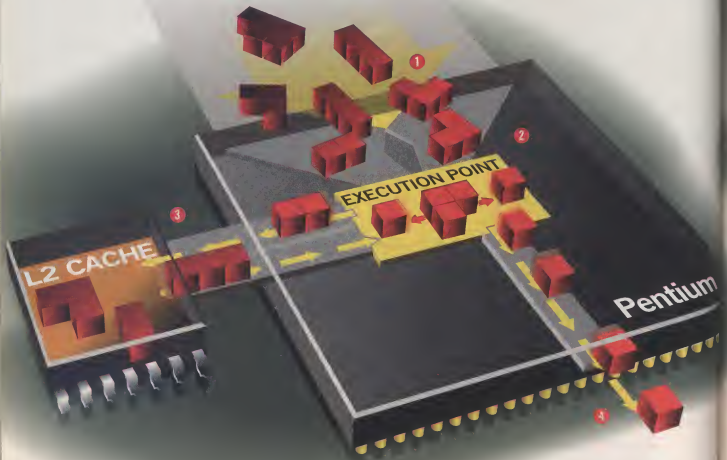
Circle 165 on reader service card.

How They Work: Pentium vs.

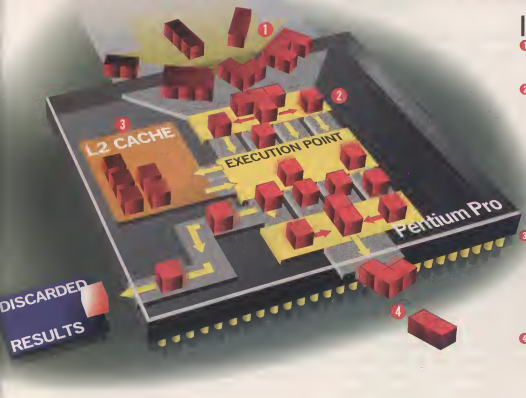
Intel's new Pentium Pro processor has introduced a different approach to handling data. Intel has optimized its new CPU to handle the requirements of a true 32-bit operating system, but has sacrificed 16-bit performance. Cyrix has opted to blend the older, Pentium-based approach with that of the newer Pentium Pro. Below we explain how each of the three CPUs processes your data.



Intel Pentium

1. Complete x86 instructions of varying sizes are sent to the CPU.
2. The CPU executes the instructions in the order they are received. Some secondary instructions can be processed simultaneously.
3. Instructions that are likely to be needed again right away are sent to the external L2 cache. Storage and retrieval of these instruction sets take several clock cycles.
4. The CPU sends the results of the executed instructions to the results pool to be used by the program.

Pentium Pro vs. 6x86

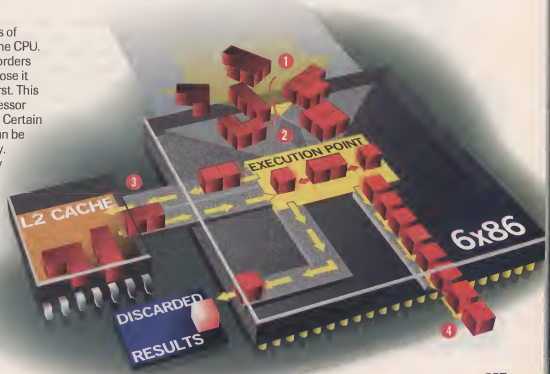


Intel Pentium Pro

1. Complete *x86* instructions of varying sizes are sent to the CPU.
2. The CPU breaks the instructions into smaller, RISC-like micro-operations and speculatively reorders them, executing those it predicts will be needed first. This allows it to keep the processor busy and the pipeline full.
3. Instructions that are likely to be needed again right away are sent to the on-chip L2 cache. Storage and retrieval take fewer clock cycles than with external L2 caches.
4. The CPU reassembles the results and sends them to the results pool. Unused results are discarded.

Cyrix 6x86

1. Complete *x86* instructions of varying sizes are sent to the CPU.
2. The CPU speculatively reorders instructions, executing those it predicts will be needed first. This allows it to keep the processor busy and the pipeline full. Certain secondary instructions can be processed simultaneously.
3. Instructions that are likely to be needed again right away are sent to the external L2 cache. Storage and retrieval take several clock cycles.
4. The CPU decides which results are needed and sends them to the results pool. All other results are discarded.



Performance Plus

They took a long time to get here, but 150MHz and 166MHz Pentium PCs have secured their rightful place as the premier platform for Windows 95. They outperform Pentium Pros running some applications, and perform nearly as fast running the vast majority of popular business programs. Starting at just over $3,000, these systems should be your first choice for Windows 3.*x* and Windows 95.

DELL DIMENSION XPS P166C

A New Dimension

PC Computing BEST

Identifying the ultimate Windows PC involves more than just looking at numbers. What's inside also makes a big difference: Internal components such as the hard disk, video accelerator, and sound card are important as well. And that's where Dell's Dimension XPS P166c shines.

Its overall performance was barely shy of Polywell's screaming-fast Poly P5166T, resulting in a virtual dead heat between the two. But the Dimension's graphics performance was 40 percent faster than the Poly P5166T's—although the Dimension's overall system price is about $200 more. Still, with its superior multimedia peripherals, the Dimension should move to the top of your shopping list.

The Dimension's video performance snagged top honors, thanks to Number Nine's top-of-the-line Imagine128 video accelerator card stocked with 4MB of VRAM—that's 2MB more than offered by the Poly P5166T. This extra video memory lets you run in full 24-bit color at resolutions up to 1,024 by 768 pixels, or even larger screen sizes (such as 1,600 by 1,200 pixels) if your monitor supports them. The Dimension also held its own in disk performance, owing to Quantum's 1.2GB Fireball hard drive. So how did the Poly P5166T gain a slight performance edge? Its 512K L2 cache was double the size of the Dimension's. But despite this cache difference, the Dimension's superb Winstone results illustrate the important role of other components—such as the video card—in determining overall performance.

Like the systems from Polywell and Robotech, Dell ships the Dimension with a six-speed CD-ROM drive from Teac. A Sound Blaster AWE32 sound card from Creative Labs and ACS 31 speakers from Altec Lansing are also standard equipment. While the Dimension offers four free PCI slots, drive expansion is limited by the availability of only one full drive bay. And usability is somewhat compromised by the system's awkward design. System maintenance and upgrades are hampered by the five screws that must be removed to gain access to internal components. *PC Computing*'s lab technicians also found that the overly sensitive power and reset switches made accidental reboots a bit too easy.

Nevertheless, if you a want state-of-the-art desktop multimedia system, the Dimension's superb performance, high-quality CD-ROM and hard drives, and outstanding choice of sound card and video accelerator make it an excellent package. And if you want to run Windows 95 on a top-notch system, you certainly won't mind the $3,749 price tag.

FILEBOX

Dimension XPS P166c

Pros: A fast PC with a great hard disk and video card.

Cons: Interior access is hampered by awkward case design. No internal modem.

Verdict: Excellent price-performance combination. Buy it.

$3,749 est. street price
Dell Computer Corp.
(800) 433-2318
Reader Service No. 700

GATEWAY P5-166XL

A Run for the Money

Gateway 2000's P5-166XL is among the top three Pentium performers we tested. And feature for feature, its price stacks up squarely against the systems from both Dell and Polywell. Overall, the P5-166XL scored about 16 percent faster than our 133MHz baseline Pentium system. Unlike Polywell's Poly P5166T and Dell's Dimension XPS P166c, the P5-166XL uses the slower 1.6GB Caviar hard drive from Western Digital.

The machine's speedy 16-bit application performance can be attributed in part to the snappy video results delivered by Matrox's 64-bit MGA Millennium video card with 2MB of Window RAM (WRAM). Fast as it is, the Matrox board isn't quite up to Number Nine's Imagine128 video card, which is used in the Dimension. If the P5-166XL were also equipped with the Imagine's 128 bits and 4MB of VRAM, the performance gap between the two systems would certainly be reduced.

Unfortunately, the P5-166XL also suffers from an awkward design. To get into the tower case, our technicians had to lay it on its side, and seven screws stood between them and the internal components. Once inside, however, it was positively roomy, and the SIMM slots were easily accessible.

The $3,799 package is rounded out with Wearnes's six-speed CD-ROM drive, Ensoniq's Soundscape wavetable sound card, Altec Lansing's ACS 400 speakers and subwoofer, and a TelePath IIV 28.8 fax modem.

The bottom line: the P5-166XL is a solid performer that can give Dell a run for its money. And it's a strong contender against both Dell's Dimension XPS P166c and Polywell's Poly P5166T.

FILEBOX

P5-166XL

Pros: Speedy performance and a first-class video card.

Cons: Second-rate hard disk, sound card, CD-ROM drive, modem, and design.

Verdict: Reasonably fast performance, but more expensive than much of the competition.

$3,799 est. street price
Gateway 2000
(800) 846-2000
Reader Service No. 701

MICRON P150 MILLENNIA

Right Down the Middle

If you're used to the stellar performance of earlier Pentium systems from Micron, you may be a bit surprised by the P150 Millennia's average benchmark showing in our roundup. While it was the only 150MHz machine other than Quantex's QP5/150 SM-2 to outperform our 133MHz baseline system, it did so by only 5 percent. Despite top-drawer components, including Quantum's 1.2GB Fireball hard drive and Diamond's Stealth 64 video accelerator, the P150 Millennia failed to impress in performance. Its hard disk and graphics performance scores were predictably similar to those of Polywell's Poly P5166T, although its six-speed CD-ROM drive from Sanyo mustered only average CD-ROM performance.

Usability was a bright spot. The tool-free Micron case, accessible with a single thumbscrew, was a welcome relief from systems that required fumbling with a screwdriver and numerous screws. The mini-tower case offers three free drive bays for future expansion (as does the desktop model; the tower offers ten). Creative Labs' Sound Blaster AWE32 audio card with Jensen's Advent 270 speakers and a 17-inch monitor from ADI are also included in the package.

Despite its middling performance, the P150 Millennia's $3,047 price makes it the least-expensive Pentium in the bunch. Although you can get a faster 166MHz Pentium system from Dell or Polywell, it'll set you back another $500 to $700. To gain a modem and a scant performance edge, you could go with the 150MHz QP5/150 SM-2 from Quantex for only $150 more than the P150 Millennia, but you'd be trading superior video and sound cards.

FILEBOX

P150 Millennia

Pros: Lowest-price system among those we tested. Great usability—no tools are required to open the case.

Cons: Not much faster than Micron's P133. No modem.

Verdict: Modest performance at a price no other system beats.

$3,047 est. street price
Micron Electronics
(800) 515-9197
Reader Service No. 702

POLYWELL POLY P5166T

The Performance Edge

Not only did Polywell's Poly P5166T nose its way to the top spot in our performance tests, but its usability won very high marks all the way around, as well. What's more, its $3,555 price tag won't raise eyebrows among the corporate bean counters.

Mind you, the Poly P5166T's performance edged past Dell's Dimension XPS P166c by less than 1 percent. Both systems are almost identically equipped, but Dell's system uses Number Nine's Imagine128 card with 4MB of VRAM, while the Poly P5166T uses Diamond's slightly slower Stealth 64 with 2MB of VRAM.

The Poly P5166T includes a 1.2GB Fireball hard drive from Quantum—found in half of the Pentiums in this roundup. It also has a six-speed CD-ROM drive from Teac and a 16-bit Sound Blaster AWE32 from Creative Labs. In addition, the system includes an enormous 512K L2 cache.

Four PCI slots, five ISA slots, and two free internal drive bays leave plenty of room to grow. Two usability details won praise from the *PC Computing* Lab technicians. First, the removable side panel makes upgrading and tinkering easier (although we'd love to see the panel attach with thumbscrews). Second, the reset and power buttons aren't oversensitive, as they are with many systems today, so there's less chance of an accidental reboot.

Is the premium you'll pay for the Poly P5166T worth the performance edge over a 133MHz Pentium? For complex graphics, big databases, and advanced financial modeling, speed unquestionably counts; word processing and spreadsheet work will benefit less. Still, it's nice to know you own the fastest Pentium money can buy.

FILEBOX

Poly P5166T

Pros: The best performer, thanks in part to an enormous 512K L2 cache.

Cons: Video card has only 2MB of VRAM; requires tools to open case.

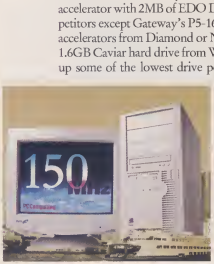
Verdict: A top-notch performer with solid components and a great price.

$3,555 est. street price
Polywell Computer
(800) 999-1278
Reader Service No. 703

QUANTEX QP5/150 SM-2

Ahead of Its Class

While it scored fourth among the eight Pentium systems we tested, the QP5/150 SM-2 from Quantex was the fastest of the 150MHz systems. Such outstanding performance is, frankly, a little surprising, given the machine's video circuitry: STB's Powergraph 64 video accelerator with 2MB of EDO DRAM. All of its competitors except Gateway's P5-166XL came with faster accelerators from Diamond or Number Nine. And its 1.6GB Caviar hard drive from Western Digital turned up some of the lowest drive performance scores we encountered, while Aztech's six-speed CD-ROM drive scored dead last in our tests, a painful 42 percent slower than the Teac drive in Polywell's Poly P5166T.



In spite of these component-level shortcomings, the QP5/150's overall performance was higher than that of all the 150MHz systems in our 16-bit application tests, and it nearly kept pace with the 166MHz Pentium systems. The QP5/150's application performance was only 7 percent lower than Gateway's system.

Performance aside, the package is well rounded. The QP5/150 comes with a 17-inch monitor from Mag Innovision, Soundscape wavetable sound card from Ensoniq, and a pair of ACS 31 speakers from Altec Lansing. While the individual components aren't the most coveted, the QP5/150 is one of the lowest-priced systems in our lineup. At $3,199, it can save you $500 to $600 over the faster systems from Dell and Gateway, and deliver modest performance gains over a typical 133MHz system. Is it enough to justify the cost of upgrading? Maybe. If you can't afford the very best, the QP5/150 SM-2 is still the top overall performer in its 150MHz Pentium class.

FILEBOX

QP5/150 SM-2

Pros: Fastest of the 150MHz systems tested, and one of the lowest in price.

Cons: Slower hard drive, video accelerator, and CD-ROM drive than other systems.

Verdict: Delivers good performance at a respectable price.

$3,199 est. street price
Quantex Microsystems
(800) 787-8686
Reader Service No. 704

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Circle 196 on reader service card.

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Connectix

Circle 195 on reader service card.

ROBOTECH COBRA XLT P166

Outdone and Undercut

A computer system isn't necessarily the sum of its parts. Despite a decent hard drive, CD-ROM drive, and video accelerator—all identical to the components in the fastest system, from Polywell—Robotech's Cobra XLT P166 lagged woefully behind other systems in our applications benchmark tests. Not only was it the slowest of the 166MHz systems we reviewed, it was outperformed by two of our 150MHz contenders.

As you might expect, the Cobra's disk and video performance results were similar to those of Polywell's Poly P5166T. But when it came to the business-world challenges of Windows applications like graphics, database, spreadsheet, and word processor, the Cobra system collapsed. It managed to eke out only a tiny performance gain over our baseline 133MHz system from Micron. Although a price-performance trade-off can make a slower system attractive, the Cobra offered no such benefit. It costs virtually the same ($3,778) as the speedier 166MHz offerings from Dell and Gateway. The Cobra includes a proprietary sound card, a 17-inch Energy Star–compliant Cobra monitor, and a 28.8Kbps internal modem from Boca Research.

There's some room for improvement in the Cobra's usability. Although its three free drive bays and roomy, tool-free case were applauded by our lab technicians, grunts and murmurs drowned out the compliments when it came time to replace the system's cover.

The bottom line? Robotech's Cobra doesn't live up to its billing. Don't let the "166" in the name fool you; there are faster and cheaper alternatives, even in the 150MHz category.

FILEBOX

Cobra XLT P166

Pros: Reputable hard drive and video card; bundled with 28.8Kbps modem

Cons: It was outperformed by less-expensive 150MHz contenders.

Verdict: Several other systems deliver a lot more for your money.

$3,778 est. street price
Robotech
(800) 533-0633
Reader Service No. 705

USA FLEX PENTIUM 150MHz MULTIMEDIA SYSTEM

Too Much for Too Little

Among all the Pentium systems we tested, USA Flex's Pentium 150MHz Multimedia System received top honors in usability. Our lab technicians had only praise for its roomy interior, with the cables neatly tucked out of harm's way, as well as for its tower case with eight expansion drive bays. But be prepared for sticker shock—the Multimedia System costs $400 more than the fastest system, Polywell's 166MHz Poly 5166T, and almost $1,000 more than the 150MHz systems from Quantex and Micron.

The high price wouldn't hurt so much if the Multimedia System had dazzled us with top-notch performance. Not only did it lag well behind its less-expensive rivals, it couldn't even keep up with the baseline 133MHz Pentium system in our 16-bit application benchmark tests.

Curiously, the inclusion of some respectable components didn't help. Number Nine's top-of-the-line Imagine128 video card stocked with 4MB of VRAM failed to keep the system from a poor showing. And Creative Labs' six-speed CD-ROM drive was among the slowest we saw in any system in this roundup. On the other hand, the system does include a 28.8Kbps modem.

Are we being too harsh? The Multimedia System is certainly not a *bad* setup. But we can't recommend it either. It provides no performance advantage over its 150MHz competitors and its price is much higher than its faster rivals. Our advice: Wait for a deep price discount or a system upgrade. Meanwhile, you'll get more for your dollar from other systems, including Dell's Dimension XPS P166C.

FILEBOX

Pentium 150MHz Multimedia System

Pros: Easy access to interior and lots of expansion room.

Cons: Slow overall performance despite a high price.

Verdict: Can't match the competition in price or performance.

$3,995 est. street price
USA Flex
(800) 672-3539
Reader Service No. 706

ZENITH Z-STATION GT PENTIUM 150

Costly and Sluggish

Zenith's Z-Station GT Pentium 150 improves on USA Flex's system in at least one way: It costs $160 less, though its performance is sluggish compared with that of its competition. Nevertheless, at $3,839, the Z-Station costs more than all the systems that outperformed it. For $280 less you can get Polywell's much speedier Poly P5166T.

Like USA Flex's Pentium 150MHz Multimedia System, the 150MHz Z-Station failed to surpass even our 133MHz baseline system—it was 8 percent slower when running Windows applications. This was a bit of a surprise: Although the Z-Station GT houses Western Digital's 1.6GB Caviar hard drive, which we found to be slower than the rival Quantum Fireball in our benchmark tests, it also includes Diamond's speedy Stealth 64 video accelerator.

In spite of this, the Z-Station languished in last place, largely due to its subsystem architecture. Even the best add-ons must rely on a system's device controllers, chip sets, and motherboard design. In the case of the Z-Station, worthy third-party components are slowed by the system's overall design.

The Z-Station also includes Creative Labs' Sound Blaster 16—not the AWE32 used in other systems—and has no modem, as do many less-expensive Pentium systems. Did the Z-Station make up for its shortcomings in usability? No. The easy-to-open case revealed only one expansion drive bay, and our technicians discovered it was nearly impossible to add RAM without first removing the hard drive.

If you're looking for a fast, affordable Pentium upgrade, there are better systems out there.

FILEBOX

Z-Station GT Pentium 150

Pros: Top-notch video card.

Cons: The slowest system we tested; includes lower-quality sound card.

Verdict: Relatively high price and poor performance makes this impossible to recommend.

$3,839 est. street price
Zenith Data Systems
(800) 533-0331
Reader Service No. 707

OVERVIEW CYRIX'S **6X86 PROCESSOR** CHALLENGES INTEL CPUs

MicroFlex-686/100

Watch out, Intel—Cyrix is closing in on you. Its new 100MHz 6x86 processor fairly sings, as we discovered in a sneak peek at Micro Express's MicroFlex-686/100, which sells for only $2,499. (Incidentally, the Cyrix chip costs about $200 less than an equivalent Pentium CPU.)

In keeping with the MicroFlex's *100* moniker, the Cyrix chip it contains runs at 100MHz. Yet its unique architecture allows it to deliver 133MHz Pentium performance. Superpipelining lets it perform an L1 cache access in a single clock cycle, whereas the Pentium and Pentium Pro both require as many as three clock cycles, depending on the operation.

In several ways, the 6x86 is a hybrid of Intel's Pentium and Pentium Pro processors. Like the Pentium Pro, the 6x86 performs out-of-order and speculative execution, allowing the 6x86 to look ahead and predict which results will be needed next. It then executes those instructions, regardless of their logical order in the pipeline.

Unlike the Pentium Pro, however, Cyrix's CPU processes whole *x86* instruction sets. This means that legacy 16-bit code—still found in Windows 95 and its applications—won't slow down the 6x86 chip. The RISC-like Pentium Pro, in contrast, must first break x86 instructions into micro-operations.

How much faster than a 133MHz Pentium is the 100MHz 6x86? That depends. Running our Windows 95 benchmarks, it was about even with 133MHz Intel-based systems (a meager 2 percent variance), and only 4 percent slower than a 150MHz Pentium Pro. But under Windows NT, it was 16 percent faster than the Pentium and 33 percent slower than the Pentium Pro.

Meanwhile, system makers aren't twiddling their thumbs. AST already uses Cyrix's 5x86 in its systems, and plans to adopt the 6x86, as does Epson. Both Compaq and IBM are studying the 6x86 closely as well.

MicroFlex-686/100 / Micro Express / (800) 989-9900, (714) 852-1400 / $2,499 est. street price / *Reader Service No. 713*

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Circle 178 on reader service card.

Superfast Desktop Systems

The truth is, you may never know how fast a Pentium Pro can get. Why? Because if you're still running Windows 95, or—dare we say it?—Windows 3.*x*, you don't need one. These powerhouses are built for true 32-bit operating systems. We tested the fastest Pentium Pro systems we could find to see how they perform under Windows NT. Let's not mince words: These systems will redefine your idea of speed.

DELL DIMENSION XPS PRO200

Better Not Blink

PC Computing BEST

The 150MHz Pentium Pros had barely seen the light of day when Dell's 200MHz Dimension XPS Pro200 screamed past the pack. Exactly how fast is a 200MHz Pentium Pro? The Dimension XPS Pro200 outperformed our baseline 133MHz Pentium system from Micron by more than two to one—118 percent faster, to be exact—in our benchmark tests under Windows NT.

Configured with a 200MHz Pentium Pro processor with 256K of write-back, static RAM, L2 cache; 32MB of RAM, and Number Nine's Imagine128 video accelerator with 4MB of VRAM, the Dimension XPS Pro200 was 21 percent faster than its closest 150MHz competitor in overall benchmark scores. Of course, the Dimension XPS Pro200 is the first 200MHz Pentium Pro system to hit the market, so it's not exactly an apples-to-apples comparison. Be that as it may, the Dimension XPS Pro200 is the fastest Intel-based system we've ever seen—hands down.

The Dimension XPS Pro200's four double-sided SIMM sockets accept 8MB, 16MB, and 32MB SIMMs. The system ships standard with 32MB (8MB for each socket) of 60-nanosecond parity RAM. Configured for Windows NT (Dell offers several configurations), our evaluation unit was equipped with a 2.1GB Barracuda hard drive from Seagate, Teac's six-speed Enhanced IDE CD-ROM drive, and a 17-inch monitor. Also included was Creative Labs' Sound Blaster AWE32 sound card.

When it comes to usability, the Dimension XPS Pro200's minitower case is easy to get into, with only one screw between you and the internal components. But if you're going to swap or add RAM, be prepared to remove the hard drive to get to the SIMM sockets. There are six drive bays—two internal, four external—three of which are free. Also available are six expansion slots: two ISA, three PCI, and one shared ISA/PCI slot.

Of course, speed always has its price. But in the case of the Dimension XPS Pro200, the price isn't as high as you might imagine. For $5,999 you get unheard-of performance, excellent graphics and sound cards, reliable components, and the reassurance of the Dell brand name to back it up. The company offers a three-year limited warranty and one year of free Windows NT technical support.

Overall, the Dimension XPS Pro200 is truly impressive—especially when it's used with high-end graphics and multimedia, CAD, or scientific modeling. Cheaper Pentium Pro systems are out there, but we've never seen any faster—at any price. When speed counts, no other machine comes close.

FILEBOX

Dimension XPS Pro200

Pros: Outstanding performance, excellent peripherals.

Cons: You must remove hard drive to add memory.

Verdict: The fastest PC you can buy, and at a reasonable price.

$5,999 est. street price
Dell Computer Corp.
(800) 433-2318
Reader Service No. 708

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— PC Computing, August 1995

PCComputing

★★★★ 1/2

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Plextor's 4PleX has won more awards than any other quad speed drive and the 4PleX Plus is on-track for even more... Multimedia World already named it #1. If you're ready for the award-winning horsepower of the 4PleX Plus, call 1-800-753-9661 for a dealer near you and ask to take one out for a spin.

★★★★★ Multimedia World All-Star, Nov. 1995

W W W W W Windows Magazine Feb. 1996

PLEXTOR.

*CD Plus and AutoPlay features for Windows® 95 only. Multimedia World All-Star rated #1 out of 16 CD-ROM drives, November 1995. Windows Magazine WinMag Box Score five W's (out of five), February 1996
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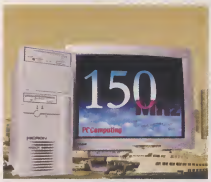
Circle 281 on reader service card.

MICRON PRO 150 MAGNUM PLUS

Power on a Budget

Like its Pentium sibling, Micron's Pro 150 Magnum Plus landed in the middle of the performance pack. This time, it's a pack of only four 150MHz Pentium Pro systems. The Magnum Plus snagged fourth place overall—third among the 150MHz systems—with a 75 percent performance gain over our baseline 133MHz system. That's nothing to sneeze at, especially when you consider that its two faster 150MHz competitors (from HP and NEC) both cost substantially more.

Like Dell's 200MHz Dimension XPS Pro200, the Magnum Plus uses Number Nine's Imagine128 video accelerator. Quantum's 2.1GB Grand Prix hard drive provides ample storage space, and Plextor's six-speed CD-ROM drive easily outperforms the quad-speed Sony drive in HP's Vectra XU 6/150. There's also the same Sound Blaster AWE32 card found in the more expensive systems, as well as a SCSI-2 port available for peripherals. Micron's classic tool-free case is a usability winner: One thumbscrew lets you in. Once inside, it's well organized and components are easily accessible. Three free drive bays are ready for future expansion.



There's a lot to like about Micron's Pro 150 Magnum Plus, not the least of which is its price. Our test system configuration is priced at $5,847, the best deal of the bunch next to Gateway's G6-150. For an additional $399, Micron will install a 1GB removable-media Jaz drive from Iomega. (See "Gigabytes to Go," February, page 176.)

The Magnum Plus strikes a sweet balance between speed and price. And when the budget bucks, it's the cheapest way to get true Pentium Pro performance.

FILEBOX

Pro 150 Magnum Plus

Pros: Nice extras, including a SCSI-2 port. Excellent usability and best price.

Cons: Middle-of-the-pack performance.

Verdict: Price-performance combination makes this a very good value.

$5,847 est. street price
Micron Electronics
(800) 515-9197
Reader Service No. 709

NEC POWERMATE PRO150

Double Your Speed

Fast. No other word co completely describes NEC's PowerMate Pro150. It was far and away the performance leader among the four 150MHz Pentium Pro systems we tested. *PC Computing* Labs' benchmark tests showed it to be nearly twice as fast as our baseline 133MHz Pentium system from Micron. Only Dell's 200MHz Dimension XPS Pro200 proved faster.

There's more to its performance than a speedy CPU. Matrox's MGA Millennium video accelerator (with 4MB of Window RAM) is standard. Surprisingly, NEC's PowerMate Pro150 even beat Micron's Pro 150 Magnum Plus in video tasks, despite the latter's faster video card. NEC's system also comes with Western Digital's 1.6GB Caviar hard drive.

Of course, NEC delivers quality multimedia too. The PowerMate Pro150 included NEC's 17-inch MultiSync XV17 display. For sound, NEC chose the popular Sound Blaster AWE32 from Creative Labs. The PowerMate Pro150 is network-ready, with a preinstalled Ethernet card from 3Com. And Adaptec's 2940W adapter provides Fast-Wide SCSI-2 connectivity.

The PowerMate Pro150 was a usability favorite. Our lab technicians praised the case design, which opens via two hand-twist screws; and a removable side panel gives easy access to the roomy interior. Three of six expansion drive bays were available, and two of the system's four PCI slots remained free.

The $6,669 price isn't bad considering the PowerMate Pro150's exceptional performance, but with the Dimension XPS Pro200's larger hard disk, better video card, and killer benchmark scores, it's hard to find a reason not to buy the cheaper 200MHz system instead.

FILEBOX

PowerMate Pro150

Pros: Fastest 150MHz Pentium Pro system we tested.

Cons: Price can't match other high-performance systems.

Verdict: A solid choice, thanks to speedy performance and excellent peripherals.

$6,669 est. street price
NEC Technologies
(800) 632-4636
Reader Service No. 710

GATEWAY G6-150

Little Spent, Less Gained

Ordinarily you wouldn't complain about a system that's 61 percent faster than a 133MHz Pentium. But in this case, that score landed Gateway 2000's G6-150 in last place in our Pentium Pro benchmark tests. Don't get us wrong—the G6-150 system isn't slow. It would probably beat the pants off the system currently on your desk. But is it the best deal for the money?

The G6-150's 2GB SCSI hard drive from Seagate performs respectably, although it won't wow you as keenly as will Quantum's Fireball. The G6-150's MGA Millennium from Matrox with 4MB of WRAM is one of the top video accelerators. And Wearnes's six-speed CDD-620 CD-ROM drive, while not well known, is nothing to complain about, either.

But the G6-150 lacks some of the niceties provided at little or no cost by Gateway's competitors. There is no sound card or modem, for instance, nor are there any extras, like an Ethernet card or SCSI adapter.

When you crack open the case on the G6-150's full-size tower, you'll find plenty of room for expansion. There are eight available drive bays: five internal half-height and three external full-height. But if you plan to spend much time inside your PC, you'll probably be frustrated by the eight time-consuming screws that stand between you and the system's interior.

When all is said and done, Gateway's G6-150 is a respectable machine. It offers moderate performance at a decent price. But if you're willing to spend about $600 more, you can buy Micron's Pro 150 Magnum Plus, which delivers better performance, top-notch peripherals, and other extras.

FILEBOX

G6-150

Pros: Least expensive Pentium Pro system we tested.

Cons: Performance was relatively slow. Lacks extras found in other systems.

Verdict: Easiest on the pocketbook, but you get what you pay for. There are better choices.

$5,229 est. street price
Gateway 2000
(800) 846-2000
Reader Service No. 711

HEWLETT-PACKARD VECTRA XU 6/150

Performance for a Price

This is a desktop system? Hewlett-Packard's Vectra XU 6/150 uses Error Checking and Correcting (ECC) memory in dual in-line memory modules (DIMMs), a technology usually reserved for servers. And if you find its 150MHz Pentium Pro performance flagging, you can pop in a second processor for an additional $1,400.

With all these server-class technologies, what makes the Vectra XU 6/150 a desktop PC? For starters, it's the only system in this roundup that incorporates sound circuitry—from Creative Labs—on the motherboard. It uses the same MGA Millennium video card from Matrox that's on NEC's system, but with only 2MB of Window RAM, compared with the PowerMate Pro-150's 4MB. The Vectra XU also uses Seagate's 2.1GB Barracuda, the same drive used in Dell's winning Dimension XPS Pro200. A 17-inch HP Ultra VGA monitor rounds out the package.

Usability marks were high for the Vectra XU 6/150. The case requires no tools to open because it uses two latches instead of screws. Our lab technicians found that the hard drive could easily be moved to access the four half-height expansion drive bays and other components.

Of course, the Vectra XU 6/150's price is also serverlike: a whopping $7,200. That's a full $1,200 more than Dell's 200MHz screamer, which outperformed it in every way. And HP was the only vendor to supply a quad-speed—instead of a six-speed—CD-ROM drive: Sony's CDU-76S. If you need a fast desktop system, note that HP also offers a system similar to the Vectra XU 6/150: For $1,200 less, the Vectra VT lacks only the dual-processor option and expensive ECC memory.

FILEBOX

Vectra XU 6/150

Pros: Includes high-quality ECC RAM and fast Ethernet network card.

Cons: Pricey system can't match performance of competition.

Verdict: Better suited as a file server than a desktop system.

$7,200 est. street price
Hewlett-Packard
(800) 752-0900
Reader Service No. 712

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The DCS 465 digital camera back is compatible with medium format cameras (HASSELBLAD, MAMIYA) and [illegible] Vision cameras. It offers 6 million pixel resolution and works with professional flash systems.

The DCS 460 digital camera offers 6 million pixel resolution and a high sensitivity for [illegible] and detail. Out performs digital cameras.

The DCS 420 digital camera offers 1.5 million pixel resolution and an [illegible] continuous [illegible] in 2.25 seconds. [illegible] NIKON [illegible]

The EOS-DCS 5 digital camera [illegible] seamlessly with CANON and [illegible] lenses. It offers 1.5 million pixel resolution and a continuous burst of [illegible] in just over 4 seconds.

The DC 40 camera offers [illegible] snapshot and high-resolution [illegible] 360,000 pixel images [illegible] and choice in [illegible] affordable digital [illegible]

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Top Pentium and Pentium Pro Systems

Pentiums	Price*	Processor	Hard Drive	Video Card	Features	Verdict
PC Computing BEST **Dell Dimension XPS P166c** (800) 433-2318 *Reader Service No. 700*	$3,749	166MHz	1.2GB Quantum Fireball	Number Nine Imagine128 (4MB of VRAM)	Sound Blaster AWE32	★★★★★ Top-drawer components and great performance make this an unbeatable deal.
Gateway P5-166XL (800) 846-2000 *Reader Service No. 701*	$3,799	166MHz	1.6GB Western Digital Caviar	Matrox MGA Millennium (2MB of WRAM)	Ensoniq sound card, 28.8Kbps modem	★★★★ Reputable video card and near-top performance.
Micron P150 Millennia (800) 515-9197 *Reader Service No. 702*	$3,047	150MHz	1.2GB Quantum Fireball	Diamond Stealth 64 (2MB of VRAM)	Sound Blaster AWE32	★★★★ Modest performance at an unbeatable price.
Polywell Poly P5166T (800) 999-1278 *Reader Service No. 703*	$3,555	166MHz	1.2GB Quantum Fireball	Diamond Stealth 64 (2MB of VRAM)	Sound Blaster AWE32	★★★★ Fastest—by a hair—with solid hard drive and video card.
Quantex QP5/150 SM-2 (800) 787-8686 *Reader Service No. 704*	$3,199	150MHz	1.6GB Western Digital Caviar	STB PowerGraph 64 (2MB of DRAM)	Ensoniq sound card, 28.8Kbps modem	★★★ Good performance at an affordable price.
Robotech Cobra XLT P166 (800) 533-0633 *Reader Service No. 705*	$3,778	166MHz	1.2GB Quantum Fireball	Diamond Stealth 64 (2MB of VRAM)	Cobra sound card, 28.8Kbps modem	★★ Performance fails to live up to its high price. Others systems provide better value.
USA Flex Pentium 150MHz Multimedia System (800) 872-3539 *Reader Service No. 706*	$3,995	150MHz	1GB Western Digital Caviar	Number Nine Imagine128 (4MB of VRAM)	Crystal sound card, 28.8Kbps modem	★★ Overpriced with substandard performance, despite top-notch hard drive and video card.
Zenith Z-Station GT Pentium 150 (800) 533-0331 *Reader Service No. 707*	$3,839	150MHz	1.6GB Western Digital Caviar	Diamond Stealth 64 (2MB of VRAM)	Sound Blaster 16	★★ Poor usability and last-place performance, despite high cost.
Pentium Pros						
PC Computing BEST **Dell Dimension XPS Pro200** (800) 433-2318 *Reader Service No. 708*	$5,999	200MHz	2.1GB Seagate Barracuda	Number Nine Imagine128 (4MB of VRAM)	Sound Blaster AWE32	★★★★★ You can't get better performance for this—or any—amount of money.
Micron Pro 150 Magnum Plus (800) 515-9197 *Reader Service No. 709*	$5,847	150MHz	2GB Quantum Grand Prix	Number Nine Imagine128 (4MB of VRAM)	Sound Blaster AWE32, SCSI-2 port	★★★★ Decent performance at a very respectable price.
NEC PowerMate Pro150 (800) 632-4636 *Reader Service No. 710*	$6,669	150MHz	1.6GB Western Digital Caviar	Matrox MGA Millennium (4MB of WRAM)	Sound Blaster AWE32, SCSI-2 card, Ethernet card	★★★ The top 150MHz performer with lots of extras, although it's a bit pricey.
Gateway G6-150 (800) 846-2000 *Reader Service No. 711*	$5,229	150MHz	2GB Seagate SCSI drive	Matrox MGA Millennium (4MB of WRAM)	None	★★ Lowest-cost solution, but the slowest of the Pentium Pros. Lacks extras.
Hewlett-Packard Vectra XU 6/150 (800) 752-0900 *Reader Service No. 712*	$7,200	150MHz	2.1GB Seagate Barracuda	Matrox MGA Millennium (2MB of WRAM)	Built-in Creative Labs sound circuitry; network card	★★ Better-suited as a server than as a desktop system.

*ESTIMATED STREET PRICE

★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

Speed Without Limits

Spend 20 minutes with a top-performing system, and there's no turning back. You'll never be satisfied with less. Nor should you be.

If you're running Windows 95, you can lay your hands on a fully configured, 166MHz Pentium for less than $4,000, as we discovered with Dell's Dimension XPS P166c. In fact, you can go much lower on the price scale if you're willing to settle for a 150MHz system. But if you run Windows NT, you'll have to get a Pentium Pro and lay out far more. Of course, given that your alternative is typically a $10,000 workstation, a $6,000 Pentium Pro is a bargain.

The actual performance you get depends on your operating system and the applications you run. Under Windows 95, for example, you'll typically get the best performance for the dollar with a 150MHz or 166MHz Pentium.

But clock speed is no guarantee of performance. In most systems, the subcomponents supporting the CPU are equally important. Our tests found that the 166MHz systems from Dell and Polywell outflanked other machines in this roundup primarily because of fast video cards and hard drives. And in some cases, 150MHz machines actually ran slower than our 133MHz baseline system, Micron's P133 Millennia.

Clock speed can also be deceptive among the Pentium Pro systems. While Dell's astonishing 200MHz Dimension XPS Pro200 sailed past 150MHz machines in floating-point chores, the 150MHz Pentium Pros held their own when it came to 32-bit word processing and spreadsheet tasks.

A more difficult issue is how to maximize your dollars. Some of the slower Pentiums we tested lagged behind the leader by less than 15 percent, yet cost hundreds of dollars less. Big hard drives, lots of memory, and fast video accelerators stocked with 4MB of VRAM quickly push up costs. But if the expense falls within your budget, you won't regret spending more for quality components.

Lab testing performed by SCOTT NAYLOR, LULIT BEZUAYEHU, IBRAHIM GUL, *and* DAISY ZHAO.

DECISION MAKER

CHOOSE THE RIGHT **DESKTOP SYSTEM** FOR YOUR NEEDS

1 Choose the factor most important to you.	2 Choose the next most important factor.	3 Which operating system do you use?	4 For your needs, the best product to buy is . . .
Price	Performance	Windows 95	Quantex QP5/150 SM-2
		Windows NT	Dell Dimension XPS Pro200
	Bundled Extras	Windows 95	Micron P150 Millennia
		Windows NT	Micron Pro150 Magnum Plus
Performance	Price	Windows 95	Polywell Poly P5166T
		Windows NT	Dell Dimension XPS Pro200
	Bundled Extras	Windows 95	Dell Dimension XPS P166c
		Windows NT	NEC PowerMate Pro150
Bundled Extras	Price	Windows 95	Quantex QP5/150 SM-2
		Windows NT	Micron Pro150 Magnum Plus
	Performance	Windows 95	Gateway P5-166XL
		Windows NT	NEC PowerMate Pro150

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Networks for the '90s

Client-server demystified. Plus, the best products to get you connected.

SYNOPSIS

CLIENT-SERVER APPS: *The best new network applications and where to get them.* **160**

APPLICATION SERVERS: *Reviews of the top six multiprocessor systems.* **162**

PERFORMANCE ANALYSIS: *The secret to fast server performance is the size and design of the L2 cache.* **171**

NETWORK OPERATING SYSTEMS: *Which operating system is right for your network? It depends on your applications.* **176**

Ask a dozen different people what *client-server* means, and you're likely to get 12 different answers. And the funny thing is, because client-server computing is so confusing, they might all be correct. Here's the bottom line: Client-server computing is reshaping the future of business computing. With it you can access vast amounts of data at mainframe speeds without clogging your hard disk and issuing redundant requests. You can tie together departments, workers, and branch offices—even vendors and customers—instantly and with ease. For end users, client-server systems dramatically simplify searching for information over a multitude of far-flung databases. And they give even the simplest desktop systems the power and reach of sprawling, processor-rich networks.

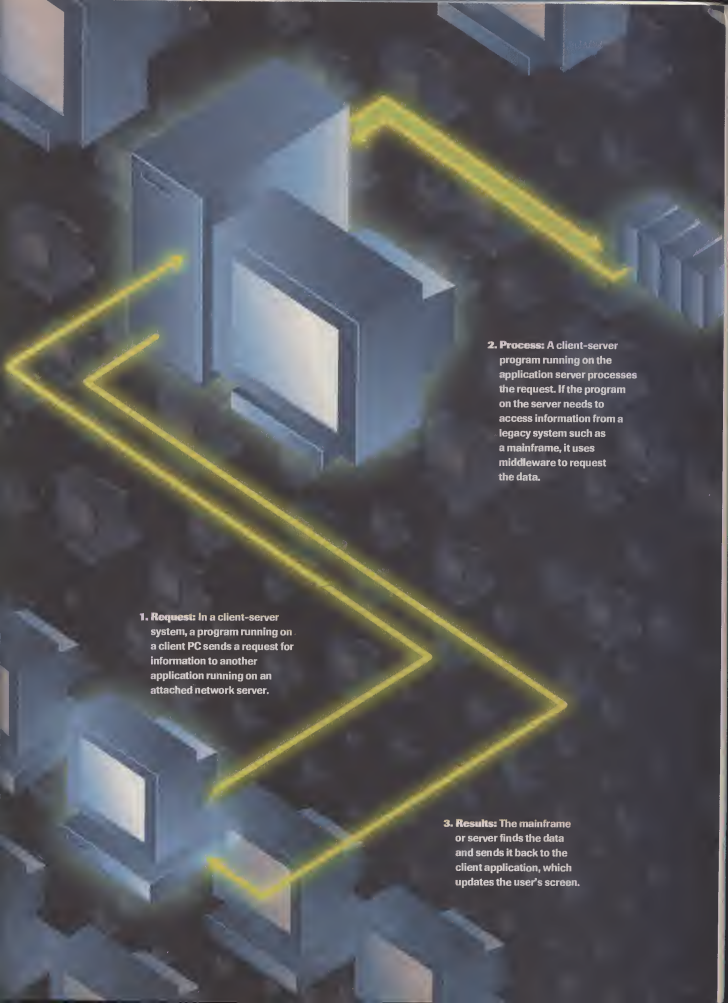
The best example of a client-server system is a networked database. At the client computer, a database front-end application (often a scaled-down database program in its own right) takes the user's question and generates the necessary structured query language (SQL) request. This query is sent over the network to the database server, which interprets it, fetches the data from one or more databases, and sends only the results of the query back to the client PC, thereby significantly reducing network traffic.

The databases themselves might be located elsewhere (for example, on a mainframe host), involving yet another layer of software called middleware. And as you can see in the illustration at the right, each computer adds its own processing power to the effort at every stage of the data-retrieval process.

Electronic messaging is another key software area that client-server computing affects significantly. Cutting-edge messaging platforms, like Lotus's Notes and Microsoft's Exchange Server, use client-server concepts to speed message delivery and improve performance. For example, instead of handling the entire routing and message-formatting process at the client PC (as is the case with traditional e-mail solutions), client-server

BY RANDALL C. KENNEDY AND ADAM MEYERSON

ILLUSTRATION BY TIMOTHY EDWARD DOWNS


2. Process: A client-server program running on the application server processes the request. If the program on the server needs to access information from a legacy system such as a mainframe, it uses middleware to request the data.
1. Request: In a client-server system, a program running on a client PC sends a request for information to another application running on an attached network server.
3. Results: The mainframe or server finds the data and sends it back to the client application, which updates the user's screen.

messaging shifts much of the delivery burden to the server. This enables developers to enhance the productivity of the client while simultaneously reducing the amount of memory it consumes.

What About the Hardware? Of course, you need some serious server hardware to run these client-server applications, and all the major server vendors offer models intended for this purpose. However, some vendors are doing nothing more than loading up high-end Pentium systems with extra RAM, bigger hard disks, and a new label, while others are genuinely focusing on the needs of businesses that are deploying these next-generation client-server applications.

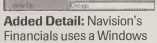
To meet the special challenges of application servers, vendors have developed symmetrical multiprocessing (SMP) system configurations that use multiple CPUs. In conjunction with an operating system that supports SMP, all the CPUs in an application server work together as a single powerful computer. This extra processing horsepower lets the servers keep up with the large number of requests they receive in a typical client-server environment, and ensures they won't slow down as the number of requests increase.

We compared the performance of six application servers using our own Ziff-Davis ServerBench utility to measure each server's processing power under varying network sizes. We also point out several of the available client-server applications and development tools, as well as evaluate what is possibly the most critical cog in any client-server computing solution: the network operating system (NOS). In particular, we analyze how well NOSs work with multiple processors.

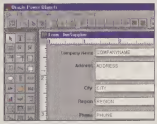
Top Client-Server Applications

Product	Type	Price*	Database Engine	Unique Features
Great Plains Dynamics C/S+ (800) 456-0025 *Reader Service No. 715*	Accounting	$2,000 to $6,000 per module; $5,000 to $12,000 for SQL Server 6.0 versions	SQL Server 6.0, Btrieve for NT	Tight integration with Microsoft's BackOffice.
Informix–NewEra (800) 331-1763 *Reader Service No. 716*	Development tool	$4,495 per client (full development environment)	Informix SE is included, and also connects to any ODBC-compliant database	Partitioning lets you break up programs across multiple systems.
Navision Financials (800) 284-7961 *Reader Service No. 717*	Accounting	$12,000 for average solution	Proprietary, plus connects to most ODBC-compliant databases	Complete midrange accounting system with Windows 95 logo-compliant interface.
Oracle PowerObjects (800) 633-0596 *Reader Service No. 718*	Development tool	$1,995; $395 for stand-alone version	Oracle 7, SQL Server 6.0, Sybase	Visual development environment for constructing client-server database front ends.
PeopleSoft Human Resources Management System 5.0 (800) 947-7753 *Reader Service No. 719*	Human resources, personnel, and benefits tracking	$100,000 per module	DB2, Informix, Oracle 7, Sybase	Part of a complete system for tracking all aspects of large businesses.
SAP America Release R/3 3.0 (800) 872-1727 *Reader Service No. 720*	Business-process reengineering, human resources	$500,000 and up, including installation	Oracle 7, Software AG, DB2, SQL Server 6.0, Informix Online	Designed to help businesses reengineer their internal processes as well as track people and resources.
Vermeer FrontPage (800) 932-0075 *Reader Service No. 721*	Web authoring system	$695	Not applicable	Creates portable Web sites that can be managed remotely by multiple authors.

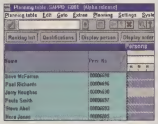
*LIST PRICE



Added Detail: Navision's Financials uses a Windows 95–compliant interface.



Building Blocks: You can create your own client with Oracle's PowerObjects.



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Typical network locations in the U.S. get mugged by an average of 289 power disturbances yearly. Surges. Spikes. Sags. Brownouts. Nasty stuff that can corrupt your data. Steal productivity.

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Processing Powerhouses

To enjoy the benefits of client-server computing, you need a powerful application server to drive the process. Unlike file servers, application servers require a great deal of processing clout. We tested six Windows NT-equipped servers designed for midrange business needs. Each housed two Pentium processors, 128MB of RAM, a RAID Level 5 disk subsystem with 8GB of storage, and four 10Base-T Ethernet ports.

HEWLETT-PACKARD NETSERVER 5/133 LS2

King of the Hill

PCComputing BEST

Trying to pick a winner in a product category as complex as application servers is never easy, but Hewlett-Packard's NetServer 5/133 LS2's excellent performance and competitive pricing made our selection process much easier. In the extensive performance benchmarks we ran at Ziff-Davis Labs, the NetServer 5/133 LS2 soundly beat the competition, offering processing power and throughput levels that even the higher-price offerings couldn't match. Most impressive was the NetServer's staying power. Even with a load of 60 clients simultaneously banging away, the NetServer suffered very little falloff from its peak throughput at 12 clients. (See "Performance: Application Servers," page 171.)

The excellent performance is due to a number of factors, including four fast PCI-based Ethernet cards from Cogent, integrated SCSI disk controllers from Adaptec, speedy Barracuda drives from Seagate, and most important, 1MB of dedicated L2 cache for each CPU. Servers with similar components but less cache memory didn't even begin to keep up with HP's offering. This clearly points out the critical importance of L2 cache for the processor-intensive operations of client-server systems. The NetServer also features error checking and correcting (ECC) memory, a type of RAM that automatically detects and fixes memory errors.

As impressive as the NetServer's performance numbers are, they tell only part of the story. The NetServer is also one of the best-designed units we tested. For example, inside the NetServer's primary case cover are complete diagrams of the unit's motherboard, memory board, and other miscellaneous configuration information. And although the case itself is not a full-size tower, it offers plenty of room for expansion. In fact, the unit's only major drawback is that it has just six hard-drive bays, forcing you to attach external drives if you wish to create a storage system of gigantic proportions.

Beyond hardware, the NetServer offers a number of powerful software utilities that simplify configuring and diagnosing the system. NetServer Assistant monitors various NetServer subsystems and alerts you when a failure is probable. Information Assistant is an intelligent information-retrieval system that provides quick access to specifications for the NetServer itself, the bundled network operating system (NOS) software, and product service-and-support procedures.

One of the unique utilities is NetServer Navigator. This bootable CD-ROM takes you step-by-step through the setup, configuration, and optimization of the entire NetServer system. As a bonus, HP throws in a copy of the OpenView for Windows network-management application.

Overall, the NetServer's unparalleled performance under heavy traffic loads, coupled with its intelligent design and well thought-out configuration features, make it the application server to beat.

FILEBOX

NetServer 5/133 LS2

Performance	★★★★★
Usability	★★★★★
Technology	★★★★
Verdict	★★★★★

Excellent performance, thoughtful case design, and impressive setup software make this the unquestioned leader.

$25,095 est. street price
Hewlett-Packard
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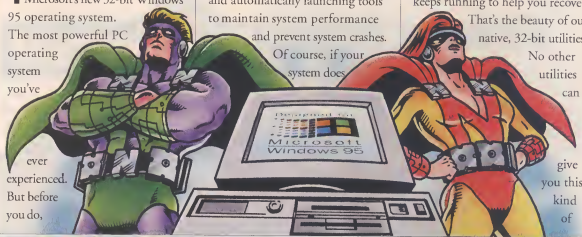
PHOTOGRAPHS BY SUAN MUSELER

You're ready to make the move to Microsoft's new 32-bit Windows 95 operating system. The most powerful PC operating system you've ever experienced. But before you do, upgrade your utilities to Norton Utilities® for Windows 95.



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IT'S A 32-BIT WORLD OUT THERE.

You already know Norton Utilities is the best set of tools for system protection, hard disk optimization and data recovery.

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And the simple utilities found in Windows 95 itself don't offer sufficient data protection for life in a 32-bit world.

Which is why you need the new Norton Utilities for Windows 95.

The first thing Norton Utilities for Windows 95 will do for you is tune up your system for Windows 95 by optimizing your hard drive and cleaning out all of the files you no longer need.

Then Norton Utilities runs in the background, monitoring your system and automatically launching tools to maintain system performance and prevent system crashes. Of course, if your system does crash or you accidentally erase a file, Norton Utilities for Windows 95 gives you the data recovery tools users have relied on from day one.

Even if other applications crash, Norton Utilities for Windows 95 keeps running to help you recover. That's the beauty of our native, 32-bit utilities. No other utilities can give you this kind of continuous, real-time protection and data recovery in the brave new world of Windows 95.

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Frees up disk space and provides a comprehensive pre-installation physical

NORTON SYSTEM DOCTOR
Continuously monitors all vital resources and data integrity. Alerts you to impending disaster and recommends action or fixes problems automatically.

NORTON DISK DOCTOR®
Automatically diagnoses and repairs file system problems using the speed and safety of 32-bit technology.

UNERASE®
100% protection of erased files. The new wizard-like interface leads you through file recovery step by step.

SYSTEM INFORMATION
Diagnoses potential conflicts and configuration problems with detailed system information and performance testing.

NORTON SPEED DISK™
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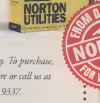
If you own Norton Utilities, Norton Desktop for Windows or PC Tools, get your $59.95 trade-up edition of Norton Utilities for Windows 95 today. To purchase, visit your software store or call us at 1-800-450-9760, ext. 9337.*



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AT&T S40

Pricey Performer

Following close on the heels of Hewlett-Packard's top-performing NetServer 5/133 LS2, AT&T's S40 was also a very good performer, posting a similar peak throughput on our ServerBench test suite and falling off only marginally as the number of active clients increased from 12 to 60.

The system's documentation and its components are all first-rate. They include Mylex's PCI-based DAC960 SCSI-2 RAID controller with 4MB of dedicated cache memory and Mylex's PNA960 four-port Ethernet controller. For storage, the system boasts four 2GB Conner hard drives and one 1GB Conner drive, all configured as a RAID Level 5 storage subsystem in hot-swappable drive bays. Like the servers from HP and Compaq, AT&T's S40 features ECC RAM. In addition, the S40 includes 1MB of dedicated L2 cache for each processor, which kept its performance within reach of HP's NetServer 5/133 LS2. Like the NetServer, the S40 can be upgraded with up to four CPUs and 768MB of RAM.

The software now included with the S40 is rather limited. As a direct result of the parent company's recent restructuring, AT&T Global Information Solutions no longer bundles Telephony Services Solution with the S40. This software offered support for advanced telecommunications functions. The company also dropped Vistium Share and Assess-IT, utilities used for managing connected users and network components. The unit still comes with Availability Manager software, however, which lets you perform limited server mirroring by having a second server take over instantly if the primary server fails.

Overall, the S40 is a tad pricey in comparison with the other systems we tested, but it offers very good performance and excellent expandability.

FILEBOX

AT&T S40

Performance	****
Usability	****
Technology	****
Verdict	****

Top-notch performance and quality components, but lacks management software and doesn't match the value of HP's NetServer.

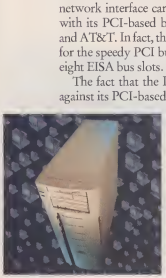
$28,849 est. street price
AT&T Global Information Solutions
(800) 447-1124
Reader Service No. 723

COMPAQ PROLIANT 4500

Simple Solution

Compaq's systems are normally the powerhouses of application-server roundups, but this time the company was haunted by a ghost from the past. The ProLiant 4500 we tested was equipped with an EISA network interface card that simply couldn't keep up with its PCI-based brethren from Hewlett-Packard and AT&T. In fact, the ProLiant doesn't offer support for the speedy PCI bus at all—the system ships with eight EISA bus slots.

The fact that the ProLiant fared as well as it did against its PCI-based competitors in our benchmark tests is a tribute to Compaq's engineering prowess. It placed only slightly behind AT&T's S40 in our ServerBench testing, and actually had higher peak throughput than HP's NetServer 5/133 LS2 before falling off when the number of clients increased. Still, the system is in dire need of a PCI overhaul if it is to continue the company's tradition of top performers. Some additional drive bays are also in order (the unit we tested had only four).



Of course, raw performance isn't everything, and the ProLiant gets high marks for its bootable SmartStart CD-ROM, which makes it a breeze to configure the ProLiant's hardware and get it up and running with your choice of network operating system.

Another interesting software feature is Compaq's Insight Manager. This integrated server-management utility lets you monitor a variety of performance and fault-tolerance statistics. It also tells you well ahead of time if it suspects a component is about to fail.

If you keep your network small, Compaq's ProLiant 4500 offers excellent performance. But if you'll be connecting a lot of clients, HP's NetServer has better performance, and even a slightly better price.

FILEBOX

ProLiant 4500

Performance	***
Usability	*****
Technology	***
Verdict	***

SmartStart CD-ROM makes installing and configuring the system easy, but it needs a PCI overhaul to boost performance.

$25,999 est. street price
Compaq Computer Corp.
(800) 345-1518
Reader Service No. 724

Gateway 2000

Portable PCs

Aurora borealis. The perfect excuse to get away.

Made sure the battery on my Gateway Solo™ S5-120XL multimedia notebook was charged, fueled up the truck and headed north. Second quarter projections could wait.

I watched Mother Nature's display dance across the northern sky. And life just seemed to make sense. Looking at my Gateway Solo S5-120XL multimedia notebook I thought, this machine also makes perfect sense. Think of it. A powerful 120MHz Intel® Pentium® processor, active matrix SVGA color display, 40MB RAM, whopping 1.2GB hard drive, and CD-ROM drive. All the power of a high-end multimedia desktop in a portable package. Who needs more?

A German opera filled the night.

I was deep in thought. Thanks to the modular CD-ROM drive and integrated speakers, features found on all models of the Gateway Solo multimedia notebook line, my favorite German opera filled the night.

Suddenly I heard hoofbeats.

GATEWAY2000 SOLO

Turning I found myself face to chest with a large white horse.

"Hello madam," said the uniformed man atop the horse. "Is that a Gateway 2000 portable? What a coincidence, I have one too!"

Desktop power that fits on a horse.

He reached into his pack and pulled out a Gateway Solo S5-75XL notebook. "My S5-75XL is loaded with a 75MHz Pentium processor, 8MB RAM, and 540MB hard drive. With the 16-bit sound, stereo speakers and a CD-ROM drive, I can use multimedia applications anywhere. Even in the boondocks. And the active matrix SVGA color display provides a great view."

More co

more

This value-packed system is ideal for the professional person on the go such as myself. And the best part, it fits on a horse, " he said with a smile. "Gateway 2000® is the place to go for great values on portable PCs. And while you can compute anywhere, I must ask you to cease and desist." I gave him a questioning look. He continued, "It's mating season for many of our furry friends and we wouldn't want the glow from your

EZ Pad™ pointing device for easy cursor navigation.

active matrix color display ruining their plans. Thank you madam and enjoy your evening." And with a tip of his hat, off he rode.

My commune with nature over, I found an offbeat diner and stopped in for some food. I felt someone watching me. As I scanned the room, our eyes met.

He was sitting at the counter, a Gateway Liberty™ small notebook in front of him. He looked vaguely familiar. I pointed to my portable and mouthed, "Gateway 2000." He smiled and gave me a thumbs up. "My Gateway Liberty small notebook is way cool," he said, pulling up a chair. "Powerful and light weight, man. It's just what I need. I'm a poet now. But I used to have a band."

nputing, olaces.

Gateway Solo notebooks are optimized for Microsoft® Windows® 95.

A band! Memories of him in a silver jumpsuit and platform shoes came flooding back! He'd been plastered all over my bedroom walls for years.

I'm telling you, Gateway is just great!

Models from the Gateway Solo multimedia line have a modular CD-ROM drive.

"I'm telling you, Gateway 2000 really takes care of their customers. I can get telephone technical support anytime. And Gateway's values are just out of this world. Hey, you wanna come over to my place and listen to some vinyl?" I had a feeling my adventures were just beginning.

For more computing, more places — call Gateway 2000 today.

intel inside pentium PROCESSOR

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- 8MB RAM (expandable to 40MB)
- 256K L2 Pipelined Burst Cache
- 540MB Hard Drive
- Modular 2X CD-ROM Drive
- Modular 3.5" Floppy Drive
- Integrated 16-Bit Sound with Stereo Speakers
- 1MB Video RAM
- Lithium Ion Battery & AC Pack
- EZ Pad™ Pointing Device
- 86-Key MS Windows 95 Keyboard
- Parallel, Serial, Infrared, VGA & PS/2® Ports
- Built-In Mic, Headphone and Line-In Jacks and External Volume Control Dial
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- 11.8" x 8.8" x 2.0"
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- MS Works 95
- Carrying Case

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S5-90XL

- 10.4" SVGA Color Display
- 90MHz Intel Pentium Processor
- 16MB RAM (expandable to 40MB)
- 256K L2 Pipelined Burst Cache
- 810MB Hard Drive
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- Modular 3.5" Floppy Drive
- Integrated 16-Bit Sound with Stereo Speakers
- 1MB Video RAM
- Lithium Ion Battery & AC Pack
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- 86-Key MS Windows 95 Keyboard
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- Built-In Mic, Headphone and Line-In Jacks and External Volume Control Dial
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- 11.8" x 8.8" x 2.0"
- Microsoft Windows 95*
- MS Office 95, Professional Edition†
- Carrying Case

$3999

S5-120XL

- 10.4" SVGA Color Display
- 120MHz Intel Pentium Processor
- 40MB RAM
- 256K L2 Pipelined Burst Cache
- 1.2GB Hard Drive
- Modular 2X CD-ROM Drive
- Modular 3.5" Floppy Drive
- Integrated 16-Bit Sound with Stereo Speakers
- 1MB Video RAM
- Lithium Ion Battery & AC Pack
- TelePath® 28.8 Fax/Modem
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- Built-In Mic, Headphone and Line-In Jacks and External Volume Control Dial
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- MS Office 95, Professional Edition†
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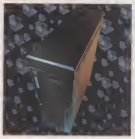
POLYWELL POLY 500EP4

Desktop in Disguise

It's significantly less expensive than the HP, AT&T, and Compaq servers, but Polywell's Poly 500EP4 suffers in comparison. It comes with standard parity RAM as opposed to ECC RAM, a shared cache architecture limited to 512K for both CPUs, and no expansion beyond the dual 133MHz Pentiums. You're also stuck with a RAM capacity of only 512MB, which is too small for really huge databases.



Furthermore, the Poly 500EP4's relatively low and flat performance curve showed the system's performance to be limited by processing bandwidth. Simply put, a shared 1MB cache just isn't enough to satiate two 133MHz Pentiums chewing away at 128MB of RAM.

To their credit, the engineers at Polywell equipped the unit with a massive case that holds 12 hot-swappable drives and a redundant power supply. But at heart, the Poly 500EP4 is really nothing more than a glorified Pentium desktop system.

FILEBOX

Poly 500EP4

Performance	**
Usability	***
Technology	***
Verdict	***

Lots of disk-expansion room but no server-management tools. Limited cache hurts performance, but it's the best of the low-price units.

$17,998 est. street price
Polywell Computer Corp.
(800) 999-1278
Reader Service No. 725

AUSTIN DIRECT AFFINITY XE

Low Price, Slow Speed

Austin Direct's entry—the lowest-price system we tested—features a cavernous case with 12 hot-swappable drive bays and easy access inside, but its interior was underpowered. The Affinity XE's shared 512K CPU cache, two-CPU limit, maximum 512MB RAM capacity, and reliance on non-ECC RAM called into question the unit's viability as a heavy-duty database platform.

The Affinity XE we tested had dual 120MHz Pentiums, and its ServerBench performance curve was relatively flat, indicating a system throttled by CPU performance. Adding more L2 cache and dedicated cache for each processor would have helped considerably.

One bright spot in the Affinity XE's otherwise disappointing turnout is the Affinity Server Management Tool. This NetWare-based server monitoring and diagnostic suite lets you control most of the Affinity XE's functions remotely from a client workstation.

FILEBOX

Affinity XE

Performance	**
Usability	****
Technology	**
Verdict	**

Slow performer suffers from architectural limitations, but good server management tools and case design—and the lowest price.

$17,490 est. street price
Austin Direct
(800) 752-1577
Reader Service No. 726

EVEREX STEP DP

All Cached Out

Everex's application server proved to be a real disappointment because its performance was the slowest of all the systems we tested. The Step DP's poor showing was likely due to its meager L2 cache. Our test system was delivered with a measly 256K of shared cache, and the unit maxes out at only 512K. Needless to say, this was a dubious design choice, and it crippled what otherwise could have been a respectable entry.

On the plus side, the Step DP's external RAID subsystem (from Clariion) was an interesting departure from its competitors. While the hardware worked adequately, we couldn't get the extensive disk-management tools up and running even with onsite help from an Everex representative.

Otherwise, the Step DP did little to distinguish itself. The L2 cache limitations, in addition to a maximum RAM capacity of 512MB, left us unable to recommend the Step DP.

FILEBOX

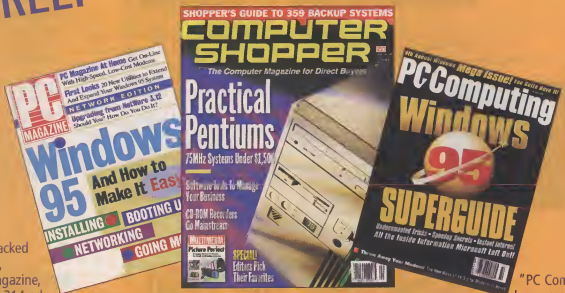
Step DP

Performance	**
Usability	**
Technology	**
Verdict	**

The Step DP's Clariion II RAID subsystem looked interesting, but otherwise the Step DP is an unremarkable system that needs more cache.

$19,995 est. street price
Everex Computer
(800) 262-3312
Reader Service No. 727

WE KEEP COMING OUT ON TOP.



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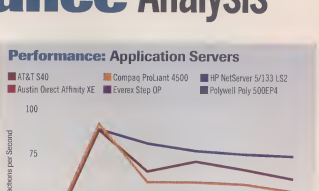
Performance Analysis

Application servers need to do two things well: process data and route it as quickly as possible. Ziff-Davis Benchmark Operations' ServerBench measures the performance of application servers running Windows NT Server 3.51 by simulating a real-world transaction-processing environment, which is exactly what a client-server database is. The test results tell a lot about how a server will perform in a live LAN.

Take our top three performers, for example. The HP, AT&T, and Compaq servers were all equipped with 1MB or more of dedicated L2 cache per CPU, which translated into higher peak-performance numbers. To be sure, other factors—the chip set and I/O architecture—affected the ultimate outcome. But everything else being equal, the size and design of a server's L2 cache has the biggest impact on overall client-server application performance. The Polywell, Austin Direct, and Everex systems overlooked this, and their performance suffered.



NOTE: SERVERBENCH 2.0 MEASURES THE NUMBER OF TRANSACTIONS PER SECOND THAT AN APPLICATION SERVER CAN PROCESS

Speed Costs: The size and design of a server's L2 cache have the biggest effect on its performance—and price.

Top Application Servers

Product	Price*	Maximum CPUs**	Max. RAM	Disk Controllers	Storage	Network Interface Card	Expansion Slots	Operating Systems
PC Computing BEST **Hewlett-Packard NetServer 5/133 LS2** (800) 322-4772 *Reader Service No. 722*	$25,095	Four 133MHz Pentiums	768MB	Dual integrated Adaptec Fast Wide SCSI-2	5 Seagate 2.1GB Barracuda drives	4 Cogent PCI 10Base-T	2 PCI, 2 PCI/EISA, 4 EISA	Windows NT, NetWare, SCO Unix
AT&T S40 (800) 447-1124 *Reader Service No. 723*	$28,849	Four 133MHz Pentiums	768MB	Mylex PCI SCSI-2 RAID controller	1 Conner 1GB and 4 Conner 2GB drives	Mylex PCI 4-port 10Base-T	2 PCI, 2 PCI/EISA, 4 EISA	Windows NT, NetWare, SCO Unix
Compaq ProLiant 4500 (800) 345-1518 *Reader Service No. 724*	$25,999	Four 133MHz Pentiums	1GB	Compaq integrated Fast Wide SCSI-2	4 Conner 2.1GB drives	4 NetFlex-3/E EISA 10Base2 and 10Base-T	8 EISA	Windows NT, NetWare, SCO Unix
Polywell Poly 500EP4 (800) 999-1278 *Reader Service No. 725*	$17,998	Two 133MHz Pentiums	512MB	Mylex PCI RAID controller	5 Seagate 2.1GB Barracuda drives	Cogent PCI 4-port 10Base-T	3 PCI, 1 PCI/EISA, 4 EISA	Windows NT, NetWare, SCO Unix
Austin Direct Affinity XE (800) 752-1577 *Reader Service No. 726*	$17,490	Two 120MHz Pentiums	512MB	Mylex PCI RAID controller	6 Conner 2GB drives	Cogent PCI 4-port 10Base-T	4 PCI, 6 EISA	Windows NT, NetWare, Solaris
Everex Step DP (800) 262-3312 *Reader Service No. 727*	$19,995	Two 133MHz Pentiums	512MB	NCR PCI SCSI	1 Conner drive, plus 5 Hewlett-Packard 2GB drives***	Cogent PCI 4-port 10Base-T	2 PCI, 1 PCI/EISA, 5 EISA	Windows NT, NetWare, SCO Unix, Solaris

*ESTIMATED STREET PRICE. **ALL SERVERS WERE TESTED WITH TWO CPUS AND 128MB OF RAM. ***INCLUDED IN THE CLARIION II RAID SUBSYSTEM

You go swimming only minutes after eating.

You walk under ladders.

You use a butter knife to remove toast from the toaster.

Then you go and test your client/server design at an IBM Open Systems Center.

So much for your daredevil image.

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Even those who live on the edge know they shouldn't take chances when designing a client/server system for their business. With so much to be gained, you have to be sure that everything goes just right.

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Does your current system use hardware and software from a variety of vendors? At an IBM Open Systems Center you'll find a wealth of experience in designing multivendor environments. And, just as important, a willingness to look for solutions wherever they might exist. So you can design a system that lives up to everyone's expectations.

Of course, you'll also find the skills you need to better evaluate technology alternatives, explore interoperability options, address security concerns, even identify ways to expand your system down the road. All to make sure your investment remains secure and your system intact.

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Final Analysis: Which Application Server Is Best for Your Company?

Multiengine Speedsters

It's a rare day indeed when you can easily recommend a single product over its competition. In the case of our various application-server contenders, that product is Hewlett-Packard's NetServer 5/133 LS2. Posting the best overall performance numbers in a given roundup is often enough to justify our choice, but the NetServer went beyond our expectations by combining this blazing performance with absolutely top-notch setup and utility software, excellent documentation, and award-winning ease of use.

Close on the NetServer's heels, AT&T's S40 demonstrated that the firm's Global Information Solutions division can still turn out a barn burner. The price is a bit high compared with the competition's, but the unit's highly rated components and excellent expandability make it a solid second choice.

Perennial performance leader Compaq landed in the surprising position of third place at the end of our ServerBench testing suite. And although the ProLiant 4500's SmartStart CD-ROM makes it extremely easy to install, the aging EISA-dependent design makes it a harder sell for large-scale networks. If Compaq upgrades the machine to PCI, it will have a very serious contender.

The systems from Polywell, Austin Direct, and Everex provided reasonably easy access to their innards for upgrades, but none offered performance benefits to distinguish it from the competition. The prices for these three are much lower than the higher-performing servers', but they also suffer from limited expansion options, including a maximum of two CPUs, compared with four in each of the top performers. Polywell's Poly 500EP4, though it was the fastest of the bottom three, still seems like an overgrown Pentium desktop system. The same can be said of Austin's Affinity XE and Everex's Step DP: Both need more L2 cache and better RAM expansion before we can recommend these systems.

RANDALL C. KENNEDY *is a freelance technical writer based in Albany, California. Lab testing performed by* SCOTT NAYLOR *and* IBRAHIM GUL.

DECISION MAKER CHOOSE THE RIGHT **APPLICATION SERVER** FOR YOUR NEEDS

1 Choose the factor most important to you.	2 Choose the next most important factor.	3 What else is important?	4 For your needs, the best product to buy is . . .
Performance	Price	Expandability	HP NetServer 5/133 LS2
		Bundled Extras	HP NetServer 5/133 LS2
	Usability	Expandability	HP NetServer 5/133 LS2
		Bundled Extras	AT&T S40
Price	Performance	Expandability	HP NetServer 5/133 LS2
		Bundled Extras	HP NetServer 5/133 LS2
	Usability	Expandability	Polywell Poly 500EP4
		Bundled Extras	HP NetServer 5/133 LS2
Usability	Price	Expandability	HP NetServer 5/133 LS2
		Bundled Extras	Compaq ProLiant 4500
	Performance	Expandability	HP NetServer 5/133 LS2
		Bundled Extras	HP NetServer 5/133 LS2

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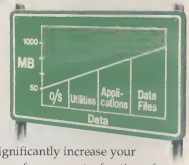

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Medalist 1080sl SCSI	1.08 GB	Fast SCSI-2	10.0 MB/s	12.5ms	5,400 RPM
Medalist 1270sl	1.28 GB	Fast ATA-2	16.6 MB/s	10.5ms	5,400 RPM
Medalist 1640	1.62 GB	Fast ATA-2	16.6 MB/s	10.0ms	5,400 RPM
Medalist 2140	2.11 GB	Fast ATA-2	16.6 MB/s	10.0ms	5,400 RPM

Seagate

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Driving Force

Choosing a network operating system (NOS) is a daunting task, particularly when it comes to application servers. The NOS must support critical applications, provide long-term growth, and make the most of multiple processors. We help you decide by evaluating three leading NOSs: Microsoft's Windows NT Server 3.51, Novell's NetWare 4.1 SMP, and IBM's OS/2 for SMP 2.11 and LAN Server 4.0.

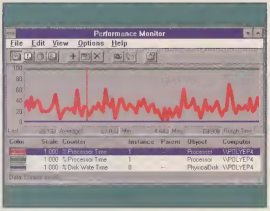
MICROSOFT WINDOWS NT SERVER 3.51

New Champ

PCComputing BEST

If you think slow and steady wins the race, keep your eyes on Microsoft's Windows NT Server 3.51. After a sluggish start, NT came on strong and is now our top operating-system choice for an application server. Early problems centered around performance and resource requirements: NT's file and print services were slow when compared with those of Novell's NetWare, and RAM requirements were steep, starting at 16MB. Even then, NT's negatives were overshadowed by its easy setup, graphical interface, massive peripheral support, and unequaled stability. Version 3.51 is excellent.

Ironically, just when Microsoft addressed NT's file-server performance, the client-server market took off. But that's always been NT's strength. It was built from the ground up as an operating system for application servers, with true symmetrical multiprocessing as a core feature. Right out of the box it supports four processors. If your applications demand more, NT can support up to 32 processors in a single server. Better still, it can be powered by your choice of platforms, including x86-compatible, Intel's Pentium, DEC's Alpha, MIPS's Rx400, or IBM and Motorola's PowerPC. Regardless of the server architecture, you can run NT.



Performance Tracking: Windows NT Server 3.51 comes with a versatile performance monitor.

Of course, all the processing power in the world is useless without applications. With its Back Office servers—including SQL Server, SNA Server, and Systems Management Server, plus its upcoming Exchange—Microsoft has established a strong base. But that alone isn't enough. Other players are building for NT: Oracle, Informix, Ingres, SAP, and PeopleSoft. Plus, major applications like Lotus's Notes, as well as IBM's CICS and DB/2, were recently ported to NT. That makes NT a clear choice as a database server. Many Internet servers are also available for NT.

Even entrenched NetWare shops should consider NT as an application server. NT now supports protocols such as IPX/SPX, and Microsoft's File and Print Services for NetWare let an NT server function like a NetWare 3.12 server. This means you don't need to make any changes to your existing clients, whether they're running DOS or Windows 95. In fact, connectivity is where NT has little competition: Features like integrated TCP/IP, support for automatic Internet-protocol address assignments, Windows Internet Naming Service, and remote-access service make NT easy to connect to from anywhere, a critical factor for supporting client-server WANs.

If you're putting together a serious client-server environment, we highly recommend Windows NT.

FILEBOX

Windows NT Server 3.51

Pros: Full symmetrical multiprocessing; available on multiple platforms.

Cons: Native application base is smaller than competition's.

Verdict: Robust, powerful, and best overall usability.

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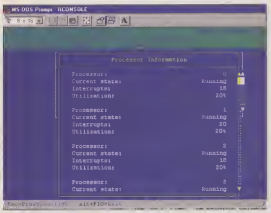
NOVELL NETWARE 4.1 SMP

Old Standard

When you think about a LAN, odds are you think of Novell's NetWare. That's because NetWare dominates the file-server market. But as an application server, NetWare has been handicapped by its single-processor architecture. Novell has addressed that limitation with its latest release—NetWare 4.1 SMP.



Stuck in DOS: NetWare 4.1 SMP's tools for monitoring performance are available only in DOS.

NetWare 4.1 SMP includes a special NetWare Loadable Module, which functions as a second processing kernel. But NetWare SMP isn't truly symmetrical. The standard 4.1 kernel and all third-party, single-threaded applications always run on processor 0 and cannot access other processors. In a truly symmetrical system, all processes are balanced across all the processors. The NetWare SMP kernel balances the load of only multithreaded processes over all the processors, up to a maximum of 32, including processor 0, if necessary.

In spite of this architectural limitation, tests of a late prerelease version showed good performance and impressive scaling when more processors were added to servers running NetWare SMP. At press time, Novell planned to sell NetWare SMP only through system vendors like Compaq, Acer, and AT&T. No pricing has been announced.

FILEBOX

NetWare 4.1 SMP

Pros: Easy to add to existing NetWare networks.

Cons: Doesn't support true symmetrical multiprocessing; few SMP applications available.

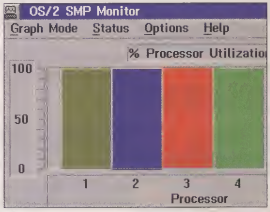
Verdict: An excellent solution for boosting NetWare's performance.

Price not yet available; sold only through system vendors
Novell
(800) 638-9273
Reader Service No. 729

IBM OS/2 FOR SMP 2.11 & LANSERVER 4.0

Wealth of Applications

Confusing is the word that best describes OS/2's application-server support. Building an application server requires both IBM's OS/2 for SMP 2.11 and its LAN Server 4.0, because OS/2 for SMP needs LAN Server to provide file and print services. IBM's upcoming release of OS/2 Warp Server combines all the necessary features into one product, but IBM says that the first release may not include symmetrical multiprocessing.



Multiple Processes: OS/2 for SMP 2.11 can use up to 32 processors, giving you plenty of power.

Thanks to OS/2's several-year head start on Windows NT and NetWare SMP, however, there are many more native, multiprocessor-enabled applications available for OS/2. But if you have a choice, go with Windows NT. For starters, OS/2's multiprocessing architecture can't continuously load-balance any thread between processors, as NT can. And OS/2 can't shift a thread in process, which means low-priority threads can keep high-priority threads waiting.

We found OS/2's installation difficult, and critical functions difficult to locate—sometimes buried two or three layers deep. That said, OS/2 delivers effective multiprocessing and is very robust. Our tests proved it virtually impossible to crash, even with 16-bit applications running.

FILEBOX

OS/2 for SMP 2.11 & LAN Server 4.0

Pros: Largest base of multithreaded applications.

Cons: Difficult to install and manage; doesn't support true symmetrical multiprocessing.

Verdict: An OK choice if your applications require it, but there are better options.

$489 for OS/2 for SMP 2.11 (1 to 7 CPUs); $380 for LAN Server 4.0
IBM
(800) 426-7695
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Final Analysis: Which Network Operating System Is Best for Your Company?

Network Lifeblood

When selecting the right operating system for your application server, make sure you know which applications you will use. If it's an out-of-the-box program, your choices will be limited to the platforms your software runs on. If you'll be developing the software, look into application-development tools.

Our network operating system pick is Microsoft's Windows NT Server 3.51. While it's still not perfect, NT is light-years ahead of both Novell's NetWare and IBM's OS/2 in ease of setup and administration. That's especially true if you're used to Windows. The current NT interface is identical to the Windows 3.*x* Program Manager, and a new Windows 95–like interface is on the horizon. NT does a great job of detecting hardware like disk controllers, CD-ROM drives, and network cards, and automatically installs the necessary drivers from the NT disc.

For those who intend to develop client-server applications, there's an abundance of tools for NT. You have plenty of choices in structured query language (SQL) databases like Oracle's Oracle 7.*x* Workgroup or Enterprise Server or Microsoft's SQL Server, and front-end development tools like PowerSoft's PowerBuilder and Symantec's Enterprise Builder. If remote access is important, NT's remote-access service is unequaled. It's easy to get working and won't fail you.

If you're a NetWare shop, Novell's new NetWare 4.1 SMP is for you. You can leverage all your knowledge of NetWare and add multiprocessing capabilities. If it sounds simple, that's because it is. Just load up the SMP NetWare Loadable Module and a few new libraries, and you'll be multiprocessing. The performance gains will surprise you, particularly if your applications are multithreaded. The only downside is that NetWare SMP is available only from OEMs.

For some people OS/2 is the best choice because of its large application base. Just be prepared to suffer through the installation, and be sure you carefully select the hardware that OS/2 supports. The next release of OS/2 Warp Server should correct most of these installation problems. ADAM MEYERSON

DECISION MAKER CHOOSE THE RIGHT NETWORK OPERATING SYSTEM FOR YOUR NEEDS

1 Choose the factor most important to you.	2 Choose the next most important factor.	3 What else is important?	4 For your needs, the best product to buy is . . .
Usability	Application Support	Ease of Installation	Novell NetWare 4.1 SMP
		Ease of Maintenance	Novell NetWare 4.1 SMP
	Stability	Ease of Installation	Microsoft Windows NT 3.51
		Ease of Maintenance	Microsoft Windows NT 3.51
Application Support	Usability	Existing Applications	IBM OS/2 for SMP and LAN Server
		New Applications	Microsoft Windows NT 3.51
	Stability	Existing Applications	IBM OS/2 for SMP and LAN Server
		New Applications	Microsoft Windows NT 3.51
Stability	Usability	Hardware Support	Microsoft Windows NT 3.51
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One-Click Presentations

Wake 'em up. Shake 'em up. Dazzle 'em with Windows 95 presentation packages.

It's the rule of presentations. No matter what the subject, every slide looks the same, right? And when the lights go off and the projector starts up, two words come to mind: *nap time.* It doesn't have to be that way. The new Windows 95 versions of Microsoft's PowerPoint, Lotus's Freelance Graphics, and Software Publishing's Harvard Graphics let you create attention-grabbing presentations that will keep your audience as alert as a double espresso would. Want to collaborate on a presentation over the network? Add animation and sound? Have team members mark up and comment on a presentation before you

BY PRESTON GRALLA

give it? Take your show on the road? The Windows 95 versions of these presentation packages let you do all of these things. We'll show you how they stack up, feature by feature, and how they can make your presentations come alive. And, to help you decide which one will make you most productive, we also brought them into *PC Computing*'s Usability Labs.

Three features are critical to any presentation package: chart creation, prebuilt content, and screen shows. We examine how the packages handle these basics, and then look at the extras the vendors have thrown in to help you really jazz up your presentations.

Chart Creation Gee-whiz presentations with lots of music and animation draw *oohs* and *aahs*, but the real heart of any presentation package is its charting features. Of the three, Harvard Graphics 4.0 offers the most sophisticated features, followed by Freelance Graphics 96 and PowerPoint for Windows 95.

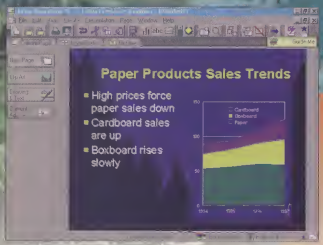
Harvard Graphics built its reputation on its prodigious charting abilities, and the Windows 95 version is no different. Any presentation program can create a horizontal bar graph. But how many offer 12 types of bar graphs? Not PowerPoint or Freelance Graphics; neither offers anything like the charting options found in Harvard Graphics.

It's easier to edit chart data in Harvard Graphics than in the other programs. All you have to do is double-click on the chart itself. Testers had difficulty editing charts in the other programs, however. In Freelance Graphics you have to click on the chart to highlight it, and then choose Edit Data from the Chart menu. In PowerPoint, creating and editing charts is even more difficult because data charting isn't built into the program. You have to use a module called Microsoft Graph, which isn't as powerful as the charting features of Harvard Graphics or Freelance Graphics. And switching between Microsoft Graph and PowerPoint is awkward.

All three programs do a good job of helping you complete the data form to create charts. For those who can't remember the difference between a legend and a label, Harvard Graphics includes a nice touch: When you fill out the data form, you see a thumbnail of the chart, with the data you're editing highlighted. Freelance Graphics also includes a thumbnail view so you can see how your chart will look while you're building it. And in PowerPoint, you see the chart's data change in real time as you fill in the data form.

Prebuilt Content If you want to quickly create a presentation for those brainstorming sessions, quarterly reviews, or business proposals, you're in luck. All of these packages provide prebuilt templates that help you whip up these kinds of presentations in no

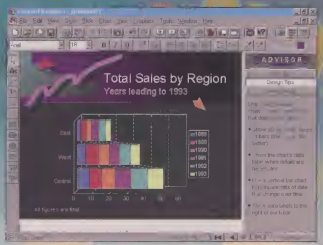
It's Show Time



Freelance Graphics

Comprehensive built-in content templates make it easy to create presentations quickly.

- **Team Reviews:** Collaboration features let you incorporate coworkers' comments.
- **Guide Me Help:** The Guide Me button walks you through trickier tasks.



Harvard Graphics

Need to do serious and sophisticated data charting? This is the program to buy.

- **Design Advice:** An always-accessible Advisor gives design tips and even checks style.
- **HyperShow:** Launch programs, OLE objects, or jump to other slides with HyperShow.

time. All you need to do is plug your own information into the content template.

Freelance Graphics offers more comprehensive and sophisticated prebuilt content than the other programs do. When you begin creating a presentation, you're asked if you want to use a content-topic template. The presentations include templates for charts such as market share by segment, cash flow, benchmark analysis, and so on.

Harvard Graphics doesn't offer as much prebuilt content as Freelance Graphics does, and the content templates themselves are difficult to find. In order to use them you have to select the Quick Presentations option—not exactly intuitive to first-time users.

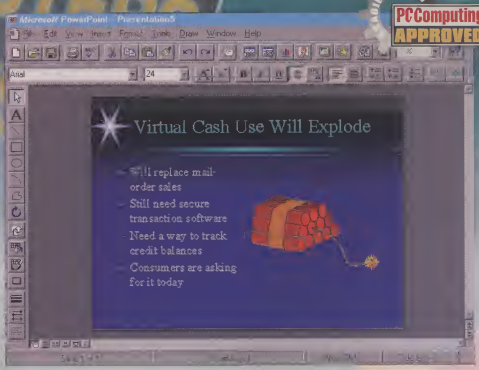
PowerPoint has less prebuilt content than Freelance Graphics and Harvard Graphics, and the content PowerPoint does have consists primarily of simple text charts. However, it is much easier to use PowerPoint's built-in content than it is to use the same features in Freelance Graphics or Harvard Graphics. PowerPoint's innovative AutoContent Wizard asks you questions, such as what kind of look you want for your presentation, what type of output you'll be using, and how long you want the presentation to last. It also asks what type of content you'll have in your presentation, such as an agenda for a company meeting or a market plan. Based on your input, it prebuilds a presentation that you can customize. It's fast, smart, and easy, although Freelance Graphics' built-in content is far superior.

Screen Shows Forget slides, overheads, and paper. The action these days is in onscreen presentations. You can add animation to slides, such as having the titles fly in or hearing a camera click when a slide appears. Adding these touches in PowerPoint is effortless with its Animation Effects toolbar. Although both Harvard Graphics and Freelance Graphics let you create animation and transitions between slides, doing this is not as easy as in PowerPoint, nor is it as accessible, because the options are buried in the menu commands.

Freelance Graphics lets you choose from a variety of slide transitions. You can also have the program display a control panel during the screen show that lets you direct the presentation as you give it, and lets you do things like draw on the page during the presentation. Particularly powerful is the screen-show sequence feature, which lets you edit effects for each object on the page separately. For example, you can have your title enter with a fly-from-the-right effect, have your bullets come in from the left, and have sounds play when certain objects appear onscreen.

In Harvard Graphics, you can also add transitions between slides, create onscreen builds, and customize your screen show in many ways. Even better, you can

Continued on page 188



QUALITY LABS
PCComputing APPROVED

PowerPoint

PowerPoint's main strength is its consistent ease of use.

- **Portable Presentations:** PowerPoint's Pack and Go Wizard copies the files you need to take your presentation on the road.
- **Instant Screen Shows:** Easily accessible icons make creating screen-show effects and animations as easy as clicking on an icon.
- **Office Integration:** PowerPoint follows the conventions of other Microsoft Office applications.

Productivity Report Card

PowerPoint Is Ready

If Dale Carnegie were alive today, no doubt he'd be using presentation-graphics programs in his quest to win friends and influence people. These programs combine solid text-creation features with whiz-bang multimedia abilities that let you present your ideas in a captivating way.

To find out just how productive the programs can make you, *PC Computing*'s Usability Labs brought in both experienced and novice users, and had them perform basic tasks with each of the three presentation packages. Here's how the products fared.

Creating a Presentation

Lotus Freelance Graphics	Microsoft PowerPoint	SPC Harvard Graphics
✔	✔	

Freelance Graphics and PowerPoint were the clear winners when it came to quickly creating a presentation. Productivity was high with both packages. Testers completed more than 90 percent of the tasks assigned to them with Freelance Graphics, and 100 percent of the tasks with PowerPoint. Harvard Graphics' sometimes quirky interface kept testers from being as productive—they struggled when creating text and bullet charts.

Modifying a Presentation

Lotus Freelance Graphics	Microsoft PowerPoint	SPC Harvard Graphics
	✔	

PowerPoint was the standout for editing slides and jazzing up a presentation with graphics, transitions, and changes to the slide backgrounds. Testers were very productive, accomplishing 95 percent of their tasks. They liked the chart editor and the ability to edit text by clicking on it. In contrast, users of Harvard Graphics and Freelance Graphics could finish only 60 percent of their tasks. Testers had difficulty editing organization charts with all of the programs.

Adding a Video Clip

Lotus Freelance Graphics	Microsoft PowerPoint	SPC Harvard Graphics

When testers were asked to put a QuickTime movie clip into a presentation, all three products failed the task. The presentation programs allow you to add video clips, but they offer no real advice on how to do so. Even worse, none of the programs informed the testers that QuickTime clips weren't supported and that they had to be inserted as OLE objects instead. Because of this, the programs' Insert Video command didn't work.

Practicing a Presentation

Lotus Freelance Graphics	Microsoft PowerPoint	SPC Harvard Graphics
	✔	

Even though testers' productivity for practicing a presentation was high for all three packages, PowerPoint outranked the others. This was largely because of PowerPoint's screen-show navigating and annotating functions, such as the transparent buttons available at the bottom of every screen. By contrast, testers of both Harvard Graphics and Freelance Graphics had a more difficult time integrating the screen-show navigation and pen-markup features.

Taking a Presentation on the Road

Lotus Freelance Graphics	Microsoft PowerPoint	SPC Harvard Graphics
	✔	

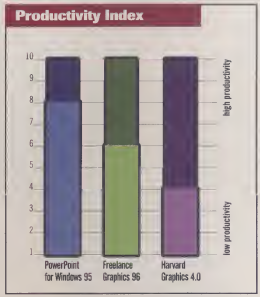
Here again PowerPoint was the winner, and this time by a mile. Testers completed 90 percent of their tasks successfully, compared to only 20 percent completion with Freelance Graphics, and 10 percent with Harvard Graphics. PowerPoint's Pack and Go Wizard made it easy to create portable presentations; testers of the other programs had to struggle with manually copying runtime players to floppies, and in the case of Harvard Graphics, copying DLL files as well.

for Prime Time

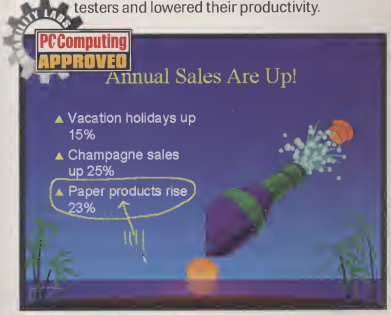
Creating a winning presentation before a big trip no longer requires an all-nighter, thanks to these packages. We found PowerPoint for Windows 95 to be the most productive tool, as shown by *PC Computing*'s Productivity Index. This index takes into account user satisfaction, the number of tasks completed successfully, the effectiveness of the program's help functions, the testers' final preference, and the technology of each product. PowerPoint is the only program that earned our Usability Seal of Approval.

Freelance Graphics 96 scored near PowerPoint on several tasks and came close to receiving our Seal of Approval. Our novice testers found its clean, uncluttered interface and innovative Guide Me help system easy, especially when creating a presentation on the fly.

Harvard Graphics—the program that launched this presentation-software category—was showing its age. For a patient, experienced user it will do the job well, but a series of interface quirks and ineffective online help frustrated testers and lowered their productivity.



Freelance Graphics: A clean, simple interface is excellent for creating slides.



PowerPoint: Features such as the ability to make notations on a presentation as you're giving it drew raves from testers.

Harvard Graphics: Editing master templates is a confounding process.

Reviews: PowerPoint, Freelance Graphics, and Harvard Graphics

Continued from page 185

preview an effect before applying it. For real screen-show pros, the program has a powerful HyperShow feature that lets you select hotkeys or create onscreen buttons to perform just about any action you'd want during a presentation—such as jumping to a particular slide, beginning a program, or even launching an OLE object. Unfortunately, HyperShow is hard to understand and difficult to use. For example, when you create a HyperShow with the HyperShow Tab, it doesn't tell you that if you want to use a button to launch an action, you must first create the button. Worse, you can't even create the button from that tab: You have to leave the tab, go to the Slide menu, and choose Add/Edit HyperShow button.

Other Features All presentation programs may look largely the same at first, but they each meet different needs. PowerPoint for Windows 95 has the best overall usability, Freelance Graphics 96 is great for sharing and revising a presentation with a group, and Harvard Graphics 4.0 offers helpful design tips and tricks.

One of PowerPoint's greatest strengths is its ease of use, and it was the only package that earned *PC Computing*'s Usability Seal of Approval (see "PowerPoint Is Ready for Prime Time," page 186). In addition, PowerPoint does a superb job integrating with other Microsoft Office applications, and with Windows 95 in general. For example, to create a new presentation, you just click on New Office Document from the Start menu. You can also export a PowerPoint presentation to a Word document with just one click using the Report It feature.

If you want to publish something on the Internet, PowerPoint also offers an add-in for saving files in HTML format, plus a new 32-bit viewer for sharing presentations over the Internet.

If you're part of a workgroup and you want to work on a presentation as a team, or get feedback from coworkers on what you've created, then there's only one program for you: Freelance Graphics. Its Team-Review features let you share your presentation via a floppy disk, post it in a public directory on a network or in a Lotus Notes database for others to share, or route it by e-mail. Team members can mark up your presentation with a standard assortment of annotation tools. Each person gets a different markup color, so it's easy to track their comments. The date and reviewer's name are attached as electronic notes, similar to yellow sticky notes. The author of the presentation can consolidate all the comments in a single file and incorporate or ignore information as they wish.

Harvard Graphics is the most difficult program to use, yet one of its strong points is the solid advice it provides for chart creation. Its Advisor steps you through the entire process of chart design. If you're not sure whether to use a vertical bar chart or a pie chart to best display your data, ask the Advisor. And as you create a slide, advice is always visible, including tips on how to create the slide, as well as design advice on how to best show off your slide for maximum impact. There's also a unique Fixer Mode within its Design Checker that will go through your presentation, find areas where your design may need work, and then suggest ways to improve it.

Presentations no longer have to mean boring slides with a bullet point here and a piece of clip art there. With the added multimedia, Internet, and collaboration abilities of these Windows 95 products, there's no excuse for subjecting audiences to snoozy presentations ever again. And with the strides these packages have made in usability, you don't have to be a designer to create a great presentation. All you need is a PC and a small investment of time.

Top Presentation Software

Product	Price*	Number of Style Templates	Total Chart Types	Content Templates	Group Review Feature	Suite Integration	HTML Support	Verdict
PC Computing BEST **Microsoft PowerPoint for Windows 95** (800) 426-9400 *Reader Service No. 715*	$300	28	14	13	No	Yes	Yes	★★★★★ By far the easiest presentation package to use, with unique features such as a wizard for creating portable presentations, and handy Internet-publishing tools.
Lotus Freelance Graphics 96 (800) 343-5414 *Reader Service No. 716*	$355	116	35	30	Yes	Yes	Yes	★★★★ Content templates and collaboration abilities are the best of the bunch. And the Guide Me feature offers aid to users when they need it.
Software Publishing Corp. Harvard Graphics 4.0 (800) 336-8360 *Reader Service No. 717*	$290	49	88	15	No	No	No	★★★ If you are a heavy-duty chart maker, look no further; this is the most powerful program for chart creation. However, its other features are harder to use than those in the other packages.

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★★★★★ *Excellent* ★★★★ *Good* ★★★ *Acceptable* ★★ *Poor* ★ *Unacceptable*

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So, you've created a riveting, promotion-earning presentation. But even with the best slides, the right hardware can make the difference between a so-so presentation and a spectacular one. With high-quality hardware for your presentations, you'll be a hit both on the road and in the boardroom. Here are five products that will project your presentation in the best possible light.

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ThinkPad 760CD / IBM / (800) 772-2227 / $7,449 est. street price / *Reader Service No. 738*

NEC AudioTower Do you want to make sure everyone in the room gets your message? If you're taking your show on the road, then NEC's AudioTower is the system to take with you. Not only are the speakers lightweight and sleek, but they also blast out high-quality sound. Best of all, you can get the set for less than $100.

AudioTower / NEC Technologies / (800) 632-4636 / $99 est. street price / *Reader Service No. 739*

In the Boardroom

Proxima Desktop Projector 2810 Do you hate dark conference rooms? You can see the presentation, but not your notes. With Proxima's DP2810, you can project your show onto the walls of the most brightly lit rooms and still have a sharp, vivid image. And Proxima's wireless pointer, the Cyclops ($495), gives you control of your software from anywhere in the room.

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SoundWorks It's hard to toot your own horn if your presentation system sounds like an old Victrola. Entrust the audio portion of your presentation to SoundWorks from Cambridge SoundWorks. This three-piece set includes two speakers and a subwoofer for rich, impeccable sound and deep, thundering bass.

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Luxus SR-1/90 / Stewart Filmscreen Corp. / (800) 762-4999 / $2,395 est. street price / *Reader Service No. 742*

Home-Court Advantage: Turn your conference room into a multimedia showcase with the help of these products.

PHOTOGRAPHS BY STEVEN UNDERWOOD

Final Analysis: Add Impact to Your Ideas

Ready, Set, Present!

The Windows 95 versions of Microsoft's PowerPoint, Lotus's Freelance Graphics 96, and Software Publishing's Harvard Graphics 4.0 are not only easier to use than previous versions—they've also added a wider variety of presentation features as well. At the same time, they've made it quick and easy to print speaker notes and slides, so that you can use them to prepare materials for off-the-cuff meetings as well as for more formal ones.

Although the features these programs offer are quite similar, they differ in ease of use. Testers found PowerPoint's usability superior to both Freelance Graphics and Harvard Graphics. Within a very short time, our testers were creating a presentation in PowerPoint, including animation and transition effects between slides. It's also the best product for creating portable presentations to give to others.

Of course, the hardest part of creating a presentation isn't building it, but selecting the right content. Freelance Graphics provides the most advanced templates and should be the first choice for anyone needing help with things such as presenting a quarterly report or a business plan. Freelance Graphics also includes powerful features for group review that no other product can match. If workgroup computing is important to you, Freelance Graphics is a solid bet.

Finally, if you need to create sophisticated data charts, consider Harvard Graphics. It's not as easy to use as the other programs, and its interface is sometimes quirky, but it has the largest variety of charts to choose from. And it makes it easier to edit chart data than either PowerPoint or Freelance Graphics do.

Regardless of the product you choose, you'll be able to create an attractive-looking, detailed presentation, but there are significant differences in how quickly and effectively you'll reach your final goal. Choose the product that best meets your needs, and makes you the most productive.

Usability Labs testing was performed by GEORGE HACKMAN, JR., LULIT BEZUAYEHU, *and* LYDIA KARLOWICZ.

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		Prebuilt Content	Lotus Freelance Graphics 96
	Screen Shows	Portable Presentations	Microsoft PowerPoint
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Chart Creation	Usability	Portable Presentations	SPC Harvard Graphics 4.0
		Prebuilt Content	SPC Harvard Graphics 4.0
	Screen Shows	Portable Presentations	Microsoft PowerPoint
		Prebuilt Content	Lotus Freelance Graphics 96
Screen Shows	Usability	Portable Presentations	Microsoft PowerPoint
		Prebuilt Content	Lotus Freelance Graphics 96
	Chart Creation	Portable Presentations	Microsoft PowerPoint
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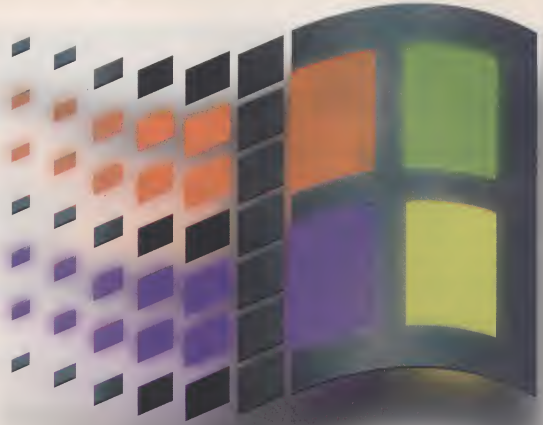

It's all here! PC Computing's exclusive Windows 95 software guide to essential—and entertaining—home and office applications.

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 More reviews on page 202

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While it's fine for basic set and industrial design, you won't want to design bridges with WalkThrough Pro. Architects should look elsewhere. Also, as in 3-D gaming, deeper colors and higher resolutions will slow your work to a crawl, and complex models will tap out lesser systems. Don't install this program on anything slower than a 100MHz Pentium—and the more memory you have, the better. Keep your Web offerings on the simple side, too, or your audience may surf elsewhere. MARK BAARD

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WalkThrough Pro 2.5

Pros: New stereoscopic viewing and Web readiness.

Cons: Less-than-powerful PCs need not apply.

Verdict: OK for experienced designers, but not for architects or novices.

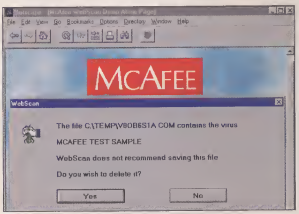
$369 est. street price
Virtus
(800) 847-8871
(919) 467-9700
Reader Service No. 745

VIRUS-DETECTION UTILITY

WebScan

Downloading files from the Internet without scanning them for viruses makes as much sense as driving your car without wearing a seat belt. You might never grab an infected file, but why take chances? McAfee's WebScan is a smart way to protect your system from infected or corrupted downloads.

The program acts as a quarantine area for downloaded files. Files are saved to WebScan, where it scans for more than 96 percent of the 5,000-plus known viruses. If the files are clean, you can save them to your system or network. WebScan supports most compressed files, as well as DOC attachments and self-extracting executables.



WebScan also has everything you need to get on the Internet. In case you don't already have e-mail and a Web browser, WebScan includes a copy of Pegasus's Mail and Spry's Mosaic. And if you're not yet online, WebScan includes offers from independent Internet service providers. WebScan also works with NetCom's NetCruiser and the 16-bit version of Netscape's Navigator. What separates WebScan from other Internet suites, such as Spry's Mosaic in a Box, is its proactive virus protection.

WebScan is a smart and easy way to protect your system from the viruses that lurk on the Internet. It will save you time and headaches, and given the $44 price tag, you can't afford not to invest in this protection. RICH SCHWERIN

FILEBOX

WebScan

Pros: Smart virus protection for Internet file downloads.

Cons: Lacks automatic configuration for 32-bit browsers.

Verdict: The best insurance against virus-infected downloads.

$44 est. street price
McAfee Associates
(800) 332-9966
(408) 988-3832
Reader Service No. 746

THE NEW PD STANDARD IS HERE

Windows 95 Compatible

ONE SCSI DRIVE
BOTH 4X CD-ROM AND REWRITABLE OPTICAL

It's the Phasewriter Dual™ with PD technology from Toray and it transcends existing standards with more flexibility than any other optical drive. Phasewriter Dual reads CD-ROMs at quad speed and reads or writes to optical disks at a blistering .87 MBytes/second transfer rate. Just drop a CD-ROM into our new Phasewriter Dual or switch to a 650 MByte single-sided rewritable disk for portable data exchange. The Phasewriter Dual is setting new standards with higher capacity and CD-ROM compatibility at a much lower cost.

And it's Fast, Fast, Fast!
Plug this drive into any platform hardware or network and you're ready to go.

The single front loading tray holds CD-ROMs or Toray's CD-size rewritable optical (PD)disks. Because it is a SCSI drive, the software identifies and mounts either media automatically.

For information on drives, media or the retailer nearest you, call **1-800-TORAY-PD**.

PHASEWRITER DUAL™

by

'TORAY'

email: info@toray.com Internet: http://www.toray.com

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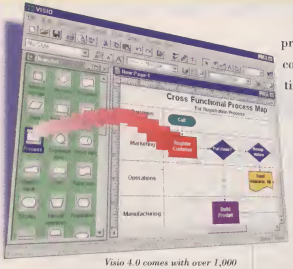


Visio 4.0 comes with over 1,000 pre-drawn SmartShapes on 29 task-specific stencils. To create diagrams, just drag SmartShapes onto the drawing page, connect, add text and voila. You're done.

When it comes to clarifying and managing your organization, processes and information, nothing does the job like clear, concise diagrams. Problem is, creating them can take more time and patience than you have to spare. Until now.

INTRODUCING VISIO 4.0—CREATING BUSINESS DIAGRAMS IS SO EASY, IT'LL BECOME A DAILY ROUTINE.

You don't have to be a creative genius to be hooked on Visio 4.0. Smart new wizards and even smarter SmartShapes make creating diagrams so fast and easy it's automatic. Simply start a wizard, import your data, and select formatting options.

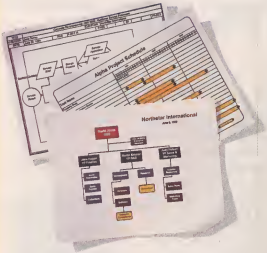
In seconds, your diagram appears before your eyes and can easily be edited and shared company-wide.

Microsoft® OFFICE Compatible

Designed for Microsoft® Windows® 95

WARNING!

DIAGRAMMING WITH NEW VISIO 4.0 CAN BE EXTREMELY HABIT FORMING.



Visio wizards do the work for you. Your organizational charts and timelines are automatically generated from the data you provide. And the Page Layout Wizard gives you a head start on all your diagrams.

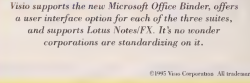
THE ONLY DIAGRAMMING SOLUTION YOU'LL WANT—OR NEED—TO USE.

With Visio 4.0, a few mouse clicks is all it takes to create flowcharts, block diagrams, organizational charts, timelines—you name it. In fact, you'll find no other diagramming solution allows you to do so much, with such little effort.

NOTHING WORKS BETTER WITH THE PROGRAMS YOU WORK IN.

Visio 4.0's OLE 2.0 technology and Microsoft Office Binder support let you seamlessly integrate smart Visio diagrams into the programs you use every day.

Visio 4.0 also comes with a 60-day money-back guarantee. Plus, it's designed to fully exploit both Windows 3.1 and Windows 95—all in one box. To order Visio 4.0 for $149—or upgrade for $79—contact your local reseller or call 800-24-VISIO ext. C29 today. Then, visit us on the web at http://www.visio.com.



Visio supports the new Microsoft Office Binder, offers a user interface option for each of the three suites, and supports Lotus Notes/FX. It's no wonder corporations are standardizing on it.

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TRAINING CD-ROM

Professor Windows 95

You've installed Windows 95. Now what? Even experienced Windows 3.1 users may feel somewhat lost when they upgrade. Individual Software's Professor Windows 95 Deluxe CD can ease the strain of your transition.

The CD takes you to the Professor's Neighborhood, a graphical town square filled with information. The University Extension's lessons cover the basics of Windows 95, plus a few more advanced topics. Step into the Info Theater and pose questions to experts simply by clicking on the back of their chairs. Or test your Windows 95 knowledge at the Driving School. The Bookstore offers an indexed list of help topics. Window Pains contains hints about getting around some annoying Windows 95 features (like AutoPlay for CDs) and what, if anything, you can do about them (hold the Shift key when you insert the CD).

For novice and intermediate users, Professor Windows 95 covers most of the necessary upgrade information. We did find a few quirks, however. There's no bubble help for clickable items and icons, and we would have liked more interactive, hands-on demonstrations of how to do tasks.

Even so, if you're feeling the strain of the upgrade, Professor Windows 95's lessons and tips will teach you just about all you need to know. GEORGE HACKMAN, JR.

FILEBOX

Professor Windows 95

Pros: Covers the basics of Windows 95.

Cons: Needs less telling and more hands-on showing.

Verdict: Entertaining training information for Windows 95 users.

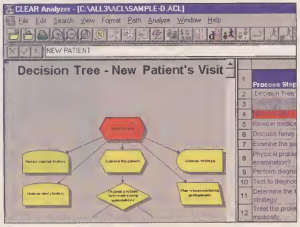
$30 est. street price
Individual Software
(800) 822-3522
Reader Service No. 747

PROCESS-MANAGEMENT SOFTWARE

Clear Process 1.0

In the belt-tightening '90s, your company must accomplish more with fewer resources. It doesn't matter whether you call it reengineering or total quality management—it just has to be done. In successful companies, continually striving to improve your organization's procedures can be a vicious circle. Want a way to stay ahead? Check out Clear Software's Clear Process 1.0.

At first glance, Clear Process resembles Micrografx's ABC ToolKit of a year and a half ago. But unlike ABC ToolKit, Clear Process creates flowcharts using script files. Just type in a text description of the process you wish to diagram, and Clear Process does the rest.



The Clear Process package includes three primary modules: AllClear 3.0 for diagram creation, Clear Analyzer for process analysis, and Clear Process for process optimization and simulation.

Clear Process is a smart choice for department and project managers who need an all-in-one change-management package and who demand the ease of use you get with script flowchart diagrams. While we'd like to see easy Web integration, the alternatives—juggling several applications or incoherent whiteboard scribblings—pale in comparison. Test-drive a free demo at PC Computing Online (see instructions on page 32). RICH SCHWERIN

FILEBOX

Clear Process 1.0

Pros: Clever usability features make easy work of difficult tasks.

Cons: Too bad there's no seamless Web integration for sharing data online.

Verdict: The only all-in-one process-management package you need.

$399 to $425 est. street price
Clear Software
(800) 338-1759
Reader Service No. 748

OUR SINCERE APPRECIATION TO THOSE OTHER PROGRAMS FOR CONTINUING TO DELETE FILES THAT WERE NEVER MEANT TO BE DELETED.

Only UnInstaller™ from MicroHelp gives you absolute peace of mind to safely clean-up your hard drive. With its exclusive SmartLinks™ technology, UnInstaller performs an intelligent series of scans on your hard drive until it thoroughly understands the inter-relationships of files and programs. Without this technology, even an experienced user may find it easy to accidentally remove a crucial file.

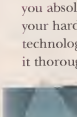
And, as an added safety net, UnInstaller automatically compresses and backs-up everything it removes. So, as you clean off bits and pieces of old files, you can take comfort in being able to put things back exactly as they were with the simple click of a button.

Of course, with other deletion programs you can have the experience of getting rid of things you never meant to get rid of. Which may be good for us, but bad for you.

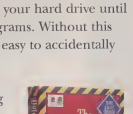
Designed for Microsoft Windows 95

Microsoft Windows Compatible

Despite popular belief, Windows 95 applications aren't very thorough at automatically removing themselves from your hard drive. Regardless of which version of Windows you use, you need UnInstaller to continually clean things up. UnInstaller Works with both 16-bit and 32-bit applications.



It's what you don't see on your hard drive that causes problems. Every application puts bits and pieces of itself in places you don't know about. Without UnInstaller, things can slow down — or come to a screeching halt.



Why take your chances with just any old clean-up program? UnInstaller is the No 1-selling Windows utility on the market with more than a million copies sold

1-800-922-3383

Available at your local software store. MicraHelp is at www.micrahelp.com

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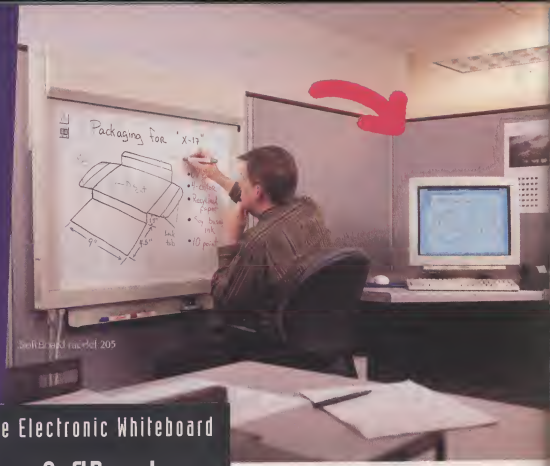
MicroHelp

HEY, EVERYONE CAN USE A LITTLE HELP.

Circle 103 on reader service card.

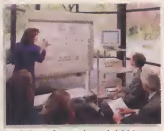


The Electronic Whiteboard

SoftBoard

For Windows & Macintosh

Imagine the project where you all have the same vision, the same objectives, and the same notes.



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SoftBoard model 201 using SBRemote conferencing software

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POWERLABS Product of the Week

Tele conference

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Circle 328 on reader service card.

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SATELLITE PRO 400CS 75MHz PENTIUM® PROCESSOR $2369
- 8MB EDO RAM expandable to 40MB maximum •810MB HD •10.4" dual scan color display •lithium ion battery •local bus video •integrated audio •2 PC card slots •pre-loaded with Windows 95 •3 year warranty

1210CS SATELLITE PRO $1688
- INTEL 486DX4/75 MHz •8MB RAM •520MB HD •3.1/2" 1.44 tdd •10.4" dual scan color display with 1MB vib video graphics •built-in trackpoint pointing device •2 PCMCIA slots •Pre-loaded with Windows 95 •1 year warranty

MODEL	PROCESSOR	RAM	HD	SCREEN	PRICE
1210C	486SX25	4MB	260	9.5" Mono	$1679
1210CS	486DX2/50	4MB	330	10.4" D/S Color	$1849
1210CS	486DX4/75	8MB	520	10.4" D/S Color	$2199
1230CT	486DX4/75	8MB	520	10.4" A/S Color	$2590
1230CS	486DX4/75	8MB	520	10.4" D/S Color	$1849
1250CS/CT	486DX4/75	8MB	520	10.4" D/S Color	$2399
1240CT	486DX4/75	8MB	810	10.4" A/S Color	$2599
1410CT	PENTIUM 90	8MB	720	9.5" A/S Color	$3499
1400CDT	PENTIUM 90	8MB	810	10.4" A/S Color	$3549
1460CS	PENTIUM 75	8MB	810	10.4" D/S Color	$2389
1470CS	PENTIUM 90	8MB	810	11.3" D/S Color	$2599
1410CT	PENTIUM 90	8MB	810	11.3" D/S Color	$3499
TEC 7000CS	PENTIUM 100	16MB	1.2G	11.3" D/S Color	$4299
TEC 7000CT	PENTIUM 133	16MB	1.2G	11.3" A/S Color	$5499

AST COMPUTER

ASCENTIA 950N LM90 PENTIUM® MULTIMEDIA $2799
- INTEL 90MHz PENTIUM® processor •8MB RAM expands to 40MB RAM •800MB removable HD •1MB vpx graphics •25.8K cache •2 PCMCIA slots •10.4" vga dual color display •lithium ion battery •3 year warranty

950N P75CS	PENTIUM 75	8MB	500	10.4" D/S Color	$2599
950N P75CS	PENTIUM 75	8MB	810	10.4" A/S Color	$2799
950N P75CT	PENTIUM 75	8MB	800	10.4" A/S Color	$3199
950N M90	PENTIUM 90	8MB	810	10.4" D/S Color	$3299
950N 120	PENTIUM 120	8MB	1.3G	11.8" A/S Color	$4299

SHARP

PC3020 •33.6b/100MHz processor •8MB RAM expandable to 40MB •800MB removable HD •10.4" dual scan color •32-bit vesa local bus w/graphics eco. •2 PCMCIA type II slots •Clickpoint trackpad •advanced power management •1 year Sharp warranty •Optional 16-bit sound card & 14.4bps fax/modem $1789

GREAT VALUE

PC-3010	$1389	PC-3050	$1789
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COMPAQ

COMPAQ LTE 5000 COLOR NOTEBOOK $3497
- 75MHz PENTIUM® processor •8MB RAM expandable to 72MB •510 MB HD •10.4" dual scan color •Built-in 16-bit sound mic & speakers •Infrared sensor for wireless communications •3 year Compaq warranty

NEW!

MODEL	PROCESSOR	RAM	HD	SCREEN	PRICE
420C	486SX/25	4MB	250	10.4" D/S Color	$1799
420CX	486DX4/75	8MB	420	10.4" Active Color	$1999
430X	486DX4/100	8MB	720	10.4" D/S Color	$2199
430CX	486DX4/100	8MB	720	10.4" Active Color	$2599
LTE5000	Pentium 75	8MB	810	11.3" D/S Color	$3499
LTE5000	Pentium 75	8MB	810	10.4" Active Color	$4499
LTE5000	Pentium 90	8MB	810	10.4" D/S Color	$3499
LTE5000	Pentium 90	8MB	810	10.4" Active Color	$5199

NEC

VERSA 20000 $1399
- INTEL 486DX4/75 MHz •8MB RAM expands to 40MB •removable 340MB HD •10.4" dual scan color display •serial port •2 PCMCIA slots •built-in 14.4 baud fax/modem •1 year NEC warranty

BUILT-IN CD-ROM

MODEL	PROCESSOR	RAM	HD	SCREEN	PRICE
VERSA C20	PENTIUM/75	8MB	340	10.4" D/S Color	$2999
VERSA 20000	PENTIUM/75	8MB	540	10.4" D/S Color	$3999
VERSA 20000	PENTIUM/75	8MB	540	10.4" Active Color	$4999
M550C	PENTIUM/90	8MB	540	12.0 LCD	$4299
M560N	PENTIUM/90	8MB	810	10.4" Active Color	$4399
M560N	PENTIUM/120	8MB	1GQ	10.4" Active Color	$4899
2000C	486DX/75	4MB	340	9.5" D/S Color	$1799
2000C	486DX/75	8MB	340	9.5" Active Color	$1949
2000C	486DX/75	8MB	540	9.5" Active Color	$2549

TEXAS INSTRUMENTS

EXTENSA 550 $2239
- 75 MHz PENTIUM® •8MB RAM expandable to 40MB •540MB removable HD •10.4" d/s color display •tray for removable cd-rom & floppy drive •speaker, mic & midi •2 PCMCIA card slots •clickpoint pointing device •wireless ir ports •1 year warranty

PENTIUM® 75MHz

IBM

THINKPAD 755CX 75MHz PENTIUM® PROCESSOR COLOR NOTEBOOK $3299
- INTEL 75 MHz PENTIUM® processor •256KB l2 cache •32 bital bus graphics •1MB video RAM •10.4" active color display •removable 540MB HD •8MB RAM expandable to 40MB •Trackpoint III •32bit Warp & Windows •15 software titles •3 year warranty

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- 486DX4/75 MHz processor •8MB RAM expandable to 24MB •540MB HD •10.4" dual scan color display •Built-in 2x CD-ROM audio ; speaker & microphone •Built-in trackpoint pointing device •1 year IBM warranty

BUILT-IN CD-ROM

MODEL	PROCESSOR	RAM	HD	SCREEN	PRICE
760D	Pentium 90	8MB	720	10.4	Active Color	$4499
760C	Pentium 90	8MB	720	12.1	Active Color	$5699
760C	Pentium 120	8MB	720	12.1	Active Color	$6199
760CD	Pentium 90	8MB	1.3G	12.1	Active Color	$5799
760CD	Pentium 75	16MB	810	10.4	Active Color	CALL
755CX	P-75 WCD	8MB	540	10.4"	Active Color	$4599
701C	486DX50	8MB	540	10.4	Active Color	$2599
701C	486DX75	8MB	540	10.4	Active Color	$2599
701CS	486DX50	8MB	360	9.5	Dual Scan	$1699
701CS	486DX75	8MB	540	9.5	Dual Scan	$1799
365	486DX75	8MB	340	10.4	Dual Scan	$1859
365	486DX75	8MB	540	10.4	Active Color	$2199
365	486DX75	8MB	540	10.4	Active Color	$2199
365CD	486DX75	8MB	540	10.4	Active Color	$2549
365CD	486DX75	8MB	540	10.4	Active Color	$2549

SAMSUNG

SENS 700 •INTEL 486DX4/75 MHz processor •8MB RAM expandable to 40MB •removable 520MB HD •11.4" dual scan color display •built-in optical trackball w/wrist rest •full business audio •built-in microphone & speaker •2 year warranty $1799

750DC	$1799	SP750C	$2399
SN750T	$2399	SP768T	$3199
SN806C	$2599	SP916T	$3499

EPSON

ACTION NOTE 650C $1099
- *10.4" DUAL SCAN*
- 486DX2/50 MHz processor •8MB RAM expandable to 20MB •250MB HD •10.4" dual scan color LCD display •local bus video •2 type II or 1 type III PCMCIA slots •built-in trackball •nimh rechargeable battery •1 year Epson warranty

GREAT VALUE

650M	$999	865C	NEW
860C	$1699	865CX	NEW
890C	$1269	960CX	$1569

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Megahertz V.34 $189
- PCMCIA FAX/MODEM WITH X-JACK •Data: V.34 (28.8 bps) & V.32 Bis (14.4 bps) •Fax: 14.4 bps send/receive •Includes Data/Fax software for Windows •6 Year Warranty

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28.8K W/X JACK	$159
Ethernet Modem Combo	$189
10 Base T W/X Jack	$129
10 Base T W/X Jack W/Coaxial	$149

U.S. Robotics

Sportster PCMCIA 14.4	$89
Sportster PCMCIA 28.8	$239
Sportster PC V.34 W/Cellular	$278
Courier DS 14.4K	$279
Courier DS V.34 28.8K	$379

Xircom

PE CE3-10BT/100C	$129/$179
PE CE3-28BT/28BC	$439/$599
PE CE3-14CM2/14CM2-28BC	$139/$399
CM2X	$299
CE-2T 10STP/10CTP	$389/$399
CNW NAVIGATOR	$299

NEW MEDIA

28.8K Net Surfer	$179
SOUND/ SCSI II Combo	$399
WAV ammer Sound Card	$175
Bus Master SCSI/Cd	$184
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Ethernet LAN 10 RT	$134

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28.8K Combo/Jr	$239
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DC & A III 170MB	$399
DC & A III HD 260MB	$449

EIGER LABS $499
- •260MB PCMCIA Type III HD •Withstands 750G's •Low Power Consumption

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28.8k V.34 w/Cellular	$299
16-bit Sound	$219
Stop 2 Card	$149
ETHERNET COMBO	$169

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CN01	Notebook Case	$34	
CF80	Premier Fabric Case	$69	
CL01	Leather Notebook Case	$89	
CEL1	Encore Leather Case	$149	
CL03	Sherpa Case	$119	
CL85	Business Traveler	$199	
CL91	Prestige Leather Case	$299	

SONY $499

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Panasonic $249

KXL-0720 2X PCMCIA CD-ROM •PCMCIA Type II connection •SCSI-2 interface •25ms •300kb/sec transfer rate •Intro & AA batteries •AC adapter supplied •2 year warranty

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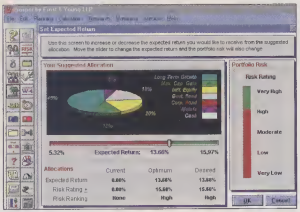
Circle 294 on reader service card.

Ernst & Young *More reviews on page 210*

PERSONAL-FINANCE SOFTWARE

Prosper

The key to making a healthy chunk of change is wise investment planning. Intuit's Quicken is the undisputed leader for personal, day-to-day finance management, but Ernst & Young's Prosper helps you set financial goals for the future. And if you're already using Quicken or Microsoft's Money, Prosper can import all your financial information.



Prosper covers all the bases of personal investing better than its main competitor, Reality Online's WealthBuilder. Plus it's easier to use. You can scrutinize broad portfolio overviews or figure out how to make your 401K plan work best for you. Prosper includes the Ernst & Young book *Personal Financial Planning Guide*, but only if you buy Prosper from a book or software store.

Although we'd like to see more of the financial-planning advice from the book incorporated in the program's online help, Prosper does lay out your options in plain English. With its simple interface and ample financial and investment avenues to explore, it's an outstanding tool for anyone who takes the time to think beyond tomorrow. JACK LYON

FILEBOX

Prosper

Pros: Simple to use and powerful, with plenty of areas to explore.

Cons: The initial setup and help files could be better.

Verdict: To help you plan your financial future, Prosper is an excellent resource.

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Ernst & Young
(800) 277-6773, (610) 277-7600
Reader Service No. 749

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Connectix

System Requirements: A PC equipped with a 386, 486, Pentium or equivalent processor • Windows 3.1 or 3.11, Windows for Workgroups 3.1 or 3.11 • 4 MB RAM required

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VIDEO CONFERENCE

TAKE PICTURES

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Circle 194 on reader service card.

 More reviews on page 216

MULTIMEDIA PRESENTATION SOFTWARE

Q-Media 3.0

You've heard the line "If you want something done right, you have to do it yourself." These days, if you want something done at all, you might find that doing it yourself is the only alternative. Jazzing up presentations with fancy sound and video effects may seem like a task you need to farm out to a professional. It isn't. Turn to Q-Media 3.0 instead. It packs in as much power as a fully loaded video-editing business, at a fraction of the cost.

Q-Media picks up where your Windows presentation software leaves off, letting you easily add a multimedia dimension to presentations—guaranteed to be the best way to keep your audience interested. Load your presentation into Q-Media, and you can dress it up with images, video, and audio.

You can also spice up any presentation by adding custom wipes, fades, and other transitions between slides, and execute those transitions with just a few clicks through Q-Media's Transition dialog box. Rarely are presentations planned far in advance, so if you're short on time or creative ideas, not to worry—the CD comes with lots of clips that offer some quick fixes. And transferring the final product to videotape is as easy as sending a file to a printer.

Q-Media offers a clean, simple way to weave multimedia into your act. The best part? You know it's been done right, because you did it all yourself.

MARK BAARD

FILEBOX

Q-Media 3.0

Pros: Good at juggling a variety of audio and video file formats.

Cons: May be too advanced for simple presentations.

Verdict: Do yourself and your audience a favor: Buy Q-Media 3.0.

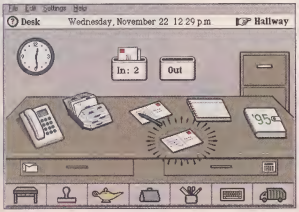
$199 est. street price ($99 if you already own a presentation package)
Q-Media Software
(800) 444-9356, (604) 879-1190
Reader Service No. 751

COMMUNICATIONS SOFTWARE

Magic Cap for Windows

How many e-mail in-boxes do you check daily? Two? Three? If it's more than one, consider a universal communications client, preferably one that doesn't cost a bundle. Try General Magic's Magic Cap for Windows.

Like ConnectSoft's E-Mail Connection and Microsoft's Exchange, Magic Cap (due out in April or May) aims to simplify your life by organizing all your electronic communication within a consistent interface. But Magic Cap goes further, adding Telescript intelligent agents and access to AT&T's PersonaLink Services. To make the universal in-box work, however, you must initially centralize all your e-mail communication and purchase an account with PersonaLink Services (at $9.95 per month). When the commercial version ships, you'll be able to access e-mail directly through your current provider.



Magic Cap's Telescript technology lets you send smart messages, or agents, that follow explicit instructions. Theoretically, you could send a Telescript-enabled message that browses for, finds, and purchases an airline ticket.

Magic Cap's visual interface is a pleasure to use. But you may not want to switch all your e-mail to PersonaLink because of the investments you've already made in your current e-mail setup. Want to check out Magic Cap for yourself? Download it for free from PC Computing Online (see instructions on page 32).

RICH SCHWERIN

FILEBOX

Magic Cap for Windows

Pros: All-in-one electronic communications with an intuitive, graphical interface.

Cons: It's a huge commitment to convert your existing e-mail setup.

Verdict: Worth a test drive, but you may want to stay put.

Free (prerelease version only)
General Magic
(800) 879-3800, (408) 774-4000
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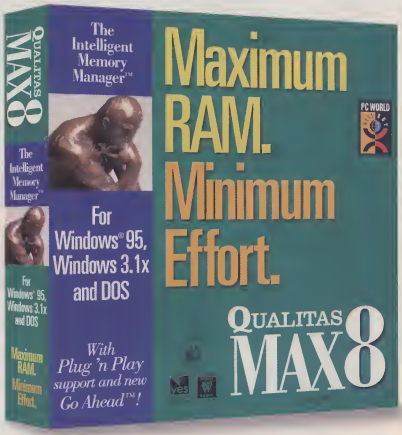
Think Your System is Optimized? Think Again.

Or better yet let Qualitas do the thinking for you. New Qualitas MAX 8 for Windows 95, Windows 3.1x and DOS optimizes your system the way other RAM programs can't. It safely manages system resources to your best advantage and maximizes Windows RAM, *without any complications.*



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Stanford Diehl, **BYTE Magazine,** October 1995

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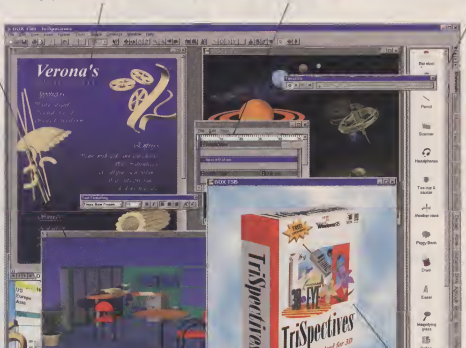

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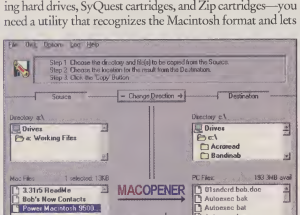
Circle 190 on reader service card.

 More reviews on page 226

FILE UTILITY

MacOpener 1.0

Working in a cross-platform environment is never easy. In addition to the religious debates on the superiority of competing operating systems, sharing information between Macintoshes and PCs is a real pain. While Apple supports DOS-formatted floppies in the Mac operating system, there's no equivalent on the PC side. For a PC to read Mac-formatted floppies or SCSI disks—including hard drives, SyQuest cartridges, and Zip cartridges—you need a utility that recognizes the Macintosh format and lets you copy files back and forth between disks.



DataViz's MacOpener offers an easy solution that works under Windows 3.1, Windows 95, and Windows NT. MacOpener is tremendously convenient: It runs as a stand-alone application and lets you preview graphics and text files before you copy them. You'll also find a customizable, built-in database of common PC file extensions, plus Macintosh file and creator types. All of this means that when you copy, say, a WordPerfect file from a Mac to a PC, the corresponding application on the PC will recognize it. With Windows 95 and Windows NT, you can even maintain your long Mac filenames.

Too bad MacOpener doesn't offer a file-translation feature—that requires DataViz's $95 Conversions Plus package. But if all you need are simple file transfers, MacOpener is a great one-trick pony. BOB O'DONNELL

FILEBOX

MacOpener for Windows 1.0

Pros: Keep long filenames when transferring from the Mac to Windows 95 or Windows NT.

Cons: Need a file translator? You'll need another $95.

Verdict: Easy Mac-to-PC file transfers.

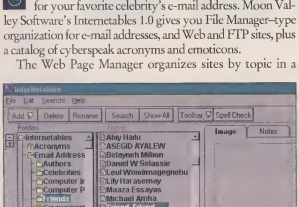
$50 est. street price
DataViz
(800) 733-0030, (203) 268-0030
Reader Service No. 753

INTERNET TOOLS

Internetables 1.0

While surfing the Web, you've undoubtedly come across cool sites that you want to add to your list of bookmarks. Or maybe you've wondered how to search for your favorite celebrity's e-mail address. Moon Valley Software's Internetables 1.0 gives you File Manager–type organization for e-mail addresses, and Web and FTP sites, plus a catalog of cyberspeak acronyms and emoticons.

The Web Page Manager organizes sites by topic in a directory tree. You can copy, move, print, or delete Web sites in the existing categories. The E-mail Addresses folder includes hundreds of listings for government offices, companies, and celebrities. Add your friends' and colleagues' addresses, too.



The Cyberspeak Acronyms Library spells out Net gibberish, and if you can't figure out obscure emoticons, search the Smiley Library for a description.

Unfortunately, the program has some serious shortcomings. The version we tested doesn't integrate well with any Internet browsers, and there's no easy way to import information into Internetables. The Cyberspeak Acronym Library, Catalog of Emoticons, and E-mail Directory are interesting curiosities, but if you're looking for a total Internet information manager, you'll want to look elsewhere. LULIT BEZUAYEHU

FILEBOX

Internetables 1.0

Pros: Hundreds of e-mail addresses.

Cons: You have to cut and paste lists of e-mail addresses or bookmarks from other programs.

Verdict: Useful online information, but Web integration is lacking.

$40 est. street price
Moon Valley Software
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Demo also available for direct download (at up to 28.8 bps) from Play's BBS at 916.985.3288. Although Snappy Video Snapshot is an odd name, it's a trademark of Play Incorporated anyway. All other trademarks are the property of their respective holders
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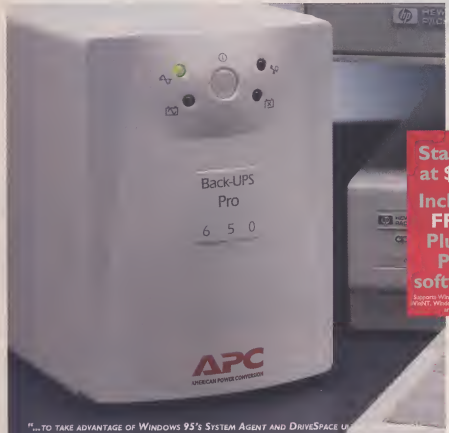

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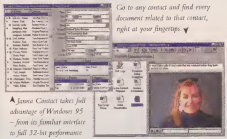

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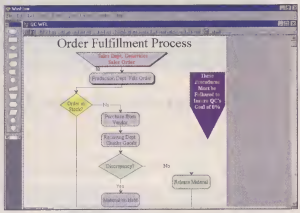
Circle 128 on reader service card.

DIAGRAMMING SOFTWARE

WinFlow 4.0

When every flowchart-application vendor claims its product is the easiest to use, they're not all lying—it's a matter of personal preference. Mainstay's WinFlow 4.0, the Windows version of the successful Macintosh product, offers some nice touches. But some of the features also miss the boat, and the $199 price tag will win few new customers.

All diagramming programs include templates, object libraries, and a catalog of lines and arrowheads. WinFlow has templates, but the names don't provide any insight into what you're going to see. Although WinFlow ships with more than 400 objects for computer and electronics diagrams, maps, organization charts, travel diaries, and even sports schedules, its competitor Visio 4.0 comes with more than 1,000 shapes.



Some of the better features are hidden by clunky metaphors. When you double-click on an object, a grid with four icons pops up. Click on any of those icons and you can start a new nested diagram, add a comment box, link a file, or assign custom functions to a shape. The problem? The icons aren't labeled, and there's no pop-up help.

WinFlow helps you draw diagrams quickly and easily, but you'll get a lot more usability and power for less dough from Visio 4.0, Patton & Patton Software's Flow Charting 4, or Micrografx's ABC FlowCharter 6.0. **JAMES OLIVER CURY**

FILEBOX

WinFlow 4.0

Pros: A simple but sparse interface.

Cons: Lacks usability enhancements such as wizards, pop-up help, preview dialogs, and dockable stencils.

Verdict: It gets the job done—but there are better products out there for less.

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DOCUMENT-MANAGEMENT SOFTWARE

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Everyone wants to receive documents differently. Some people prefer snail mail, others want faxes, while still others won't look at anything but e-mail. Qualitas's Dispatch 1.1 is your traffic cop, letting you print, fax, or e-mail documents with the click of a button.

Dispatch acts as your default print driver and works with many (but not all) communications programs, including CompuServe, MCI Mail, Delrina's WinFax Pro, Lotus's Notes, and Novell's GroupWise. It's compatible with Windows 95 and works well with Microsoft Exchange's built-in e-mail and fax functions.

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Unfortunately, Dispatch can only send documents and messages, not receive them. It would be nice to be able to receive all your documents in the same manner, whether it's via snail mail, fax, or e-mail.

The interface is clunky but easy to figure out, and if you have compatible communications software, setup is simple. Dispatch does an efficient job, and does it well. **JACK LYON**

FILEBOX

Dispatch 1.1

Pros: Send documents via e-mail and fax or to the printer, from one easy interface.

Cons: Like the name says, it's send-only.

Verdict: A good time-saver for people who send out documents in different forms.

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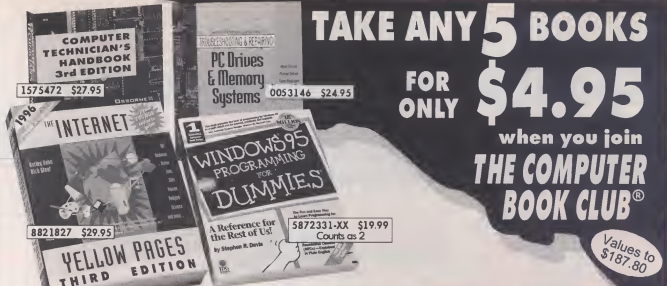

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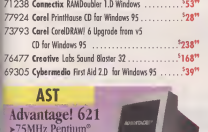

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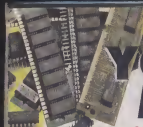

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COMPAQ

Presario 720 724 744, 774 920 924, 860 992, 982, 972, 978 954, 526, 524, 528 520 510					
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16MB	147524-001	$559	32MB	147525-001	$1,089
Presario 650 660 663, 433, 425 866, 850, 833 866					
4MB	141684-001	$161	8MB	141685-001	$307
16MB	149320-001	$599	32MB	149147-001	$1,089
ProLinea 575MX 590MX, 5133, 5100 575, 590, 4100, 466, 450					
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16MB	172714-001	$559	32MB	172715-001	$1,089
ProLinea Enhanced (all models), 466, 433, 450, CDS, 425S, 433S					
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8MB	141685-001	$307			
16MB	149320-001	$599			
DeskPro 590MX, 575MX, 575 590 5100					
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16MB	172714-001	$599	32MB	172715-001	$1,089
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PC 300 Series (all models) Aptiva (all models)					
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16MB	n/a	$559	32MB	n/a	$1 089
Aptiva 300, 500 and 700 series					
4MB	n/a	$144	16MB	n/a	$559
Eduquest 55					
4MB	74G1299	$174			

IBM, continued

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8MB	92G7520 or 73G3132	$307			
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PS/2 70-A21, A61 B21 B61 PS/Valuepoint Cxx models PS/1 Consultant, Essential, Expert models					
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IBM, continued

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PS/2 90 XP, 95 XP, P75 (pairs) 56, 57 (all) PS/1 Pro M2123					
2MB	6450902	$85			
PS/2 90 XP, 95 XP, P75 (pairs) 56, 57 (all models) PS/1 Consultant, Essential, Expert models, PS/1 Pro M2123					
4MB	6450128	$161	8MB	6450130	$307
PS/2 80-111, 311, 121, 321, 081, 161					
2MB	6450379	$88			
PS/2 80-A21, A31, A16					
4MB	6451060	$193			
Expansion boards for PS/2 80286 based models					
4-16MB w/4MB	6450609 (use 72-pin)	$299			
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4-16MB w/4MB	34F3011 (use 72 pin)	$299			

MICRON

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16MB	n/a	$559	32MB	n/a	$1,089

NEC

PowerMate Express II (all models) & Image Series (all models)					
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16MB	OP-410-30002	$613	32MB	OP-410-30002	$1,199
PowerMate Value Series (all models) & Ready Series (all models)					
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4MB	410-12002	$144	16MB	410-12003	$559
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PowerMate 286/12, SX/16, SX/20					
2MB	OP-410-8103	$89			
PowerMate 386SX/20i, vi, 16i, 25i, 486/50i, 33i					
8MB	OP-410-2101	$304			
PowerMate SX Plus					
2MB Board	n/a	$163			
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16MB	n/a	$559	32MB	n/a	$1,089

ZENITH

Z-400+ Z-Station SEh, SEn Sh, Sn, DEh, Dh and Xen Z 300/400 Series, Z-420/SX, Z-425/SX, Z-433/DX, SX					
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16MB	ME 90	$599			
Z-Station models					
1MB	ME 70	$49			
4MB	ME-100	$179			
Z-Select 100 models					
4MB	AME-0070	$179	8MB	AME-0073	$354
Zenith Z-386/20, 25, 33, 33E					
1MB	ZA3800ME	$49			
4MB	ZA3800MK	$179			
Zenith Z-386SX/16 and Z-386SX/20					
2MB	Z-605-1	$89			
Z-Server EX and LT models					
8MB	ME-432	$307			
16MB	ME 102	$599			
32MB	ME-442	$1,089			
64MB	ME-92	$2,359			
Zenith 486/33ET					
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HP LaserJet 5L					
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HP LaserJet IIIsi, 4, 4M 4Si, 4SiMX, XL300 DeskJet 1200c					
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4MB	C2065A	$169	8MB	C2066A	$339
HP LaserJet 4P, 4MP, Color LaserJet					
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HP DeskJet 500, 500C, 520 520C, 550C, 560, 560C					
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HP DesignJet 5P, 5MP					
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IBM/Lexmark Laser 4039, 4079 (all models)					
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OkiLaser 400					
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OkiLaser 400e, 410e					
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OkiLaser 830, 830 Plus, 840					
2MB	n/a	$124	4MB	n/a	$209
Panasonic LaserPartner 4400, 5400					
2MB	KX-PEM1	$110	4MB	KX-PEM2	$204
Panasonic LaserPartner 4410, 4430					
2MB	KX-P444	$115	4MB	n/a	$196
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	8MB	$359
	16MB	$689
Ascentia 900n, 910N	4MB	$192
	8MB	$359
SPECIAL	16MB	$689
Ascentia 950N	8MB	$339
	16MB	$689

COMPAQ

Model	Size	Price
Compaq Elite	4MB	$189
	8MB	$359
	16MB	$699
Contura 410 420, 430	4MB	$180
	8MB	$359
	16MB	$654
Contura 4/25	4MB	$179
	8MB	$298
	16MB	$638
Contura Aero	4MB	$185
	8MB	$329
	16MB	$659
Compaq LTE 5000	8MB	$409
	16MB	$709
	32MB	$1 399
	64MB	$2,629

DELL

Model	Size	Price
NL25 + NL20 Notebook	2MB	$94
325N + 325NC Notebook	2MB	$94
Latitude XP 450, 475, 4100	4MB	$189
	8MB	$439
	16MB	$649

DIGITAL

Model	Size	Price
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	8MB	$349
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	8MB	$369
	16MB	$619
	32MB	$1,399
Action Note 500c, 650c	4MB	$189
	8MB	$369
	16MB	$619
Action Note 700	4MB	$189
	16MB	$619

IBM

Model	Size	Price
ThinkPad Power 760	MB	Call
ThinkPad 360	4MB	$168
	8MB	$319
	16MB	$654
	32MB	$1,379
ThinkPad 701	4MB	$189
	8MB	$338
	16MB	$628
ThinkPad 730	4MB	$189
	8MB	$359
	16MB	$599
ThinkPad 755	4MB	$170
	8MB	$339
SPECIAL	16MB	$618
	32MB	$1,298
ThinkPad 700, 720	4MB	$170
and CL57SX	8MB	$339
SPECIAL	16MB	$669
	32MB	$1399
N51 Notebook	2MB	$95
	4MB	$179
L40SX, N33SX, PS/Note 182	4MB	$146
	8MB	$288

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Model	Size	Price
Versa S, Versa 2000	4MB	$179
	8MB	$318
	16MB	$619
Versa V, M, P	4MB	$189
Versa 4000 SPECIAL	8MB	$338
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	16MB	$649
Extensa 550	8MB	$369
	16MB	$659
	32MB	Call
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TravelMate 5000	8MB	$429
	16MB	$827

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Model	Size	Price
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	32MB	$1,896
T2100, T2110, T2130, T2150	4MB	$172
T2155, T2105	8MB	$335
SPECIAL	16MB	$628
	24MB	$999
T1900, T4500, T4600,	4MB (3.3 V)	$178
T4700, T4800, T4850, T4900	8MB (3.3 V)	$339
	16MB (3.3 V)	$628
	32MB	$1,200
T3400, T3600	4MB	$189
	8MB	$349
	16MB	$679
T610 Portege, SUPER SPECIAL	8MB	$399
T400, T410	16MB	$790
	32MB	$1,529
T4400, T6400 (all models)	4MB	$179
	8MB	$339
	16MB	$675

ZENITH

Model	Size	Price
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	16MB	$599
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Z-Star	4MB	$199
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Iomega Ditto Dual 800bpi Int/Ext	$146/$246
Iomega Ditto 2200 Int/Ext	$284/$386
Iomega Ditto Dual 800bpi 800mb Int	$189
3M Travan Tape Cartridge 800mb/2200mb	$31/$35

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DC 40 Digital Camera w/cw	$699
DC 50 Digital Camera w/cw	$999
MICROTEK	
PageWin for windows 300dpi grayscale OCR ser	$189
Scanmaker 5 Red 600dpi 24bit/ IC SCSI w/sw	$577
Scanmaker 5 Red 600dpi 24bit/ Sidebrush SCSI w/sw	$865
Scanmaker III Red 600dpi 48 Pb/ SCSI w/sw	$1,225
Call for pricing on all transparency adapters	
PLATY INTERNATIONAL	
Sharpz Video Frame Grabber 24bit rt grab post w/sw	$189
UMAX	
Astrada Vector 400dpi parallel port	$69
PrintPro 300dpi 256gray SCSI w/ cpgrayscl	$223
Astra 600CP Red 600dpi 16 Bmch SCSI w/sw	$410
Vista-S6 PCI 600 color 800dpi 24bit w/sw	$564
Vista-S8 PCI 600 color 800dpi 24bit w/sw	$1,126
Powerlook pro-II Red 1200dpi SCSI w/sw	$2,769
MICROTEK/ ORANGE	
Scanjet Sc Refined 600dpi 24bit w/ cdr w/ sw	$934

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Multisync XV17 17" 28mm 1280x1024ni 60hz Ref	$840
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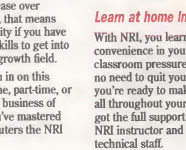

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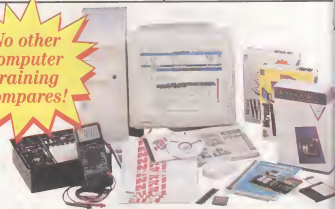

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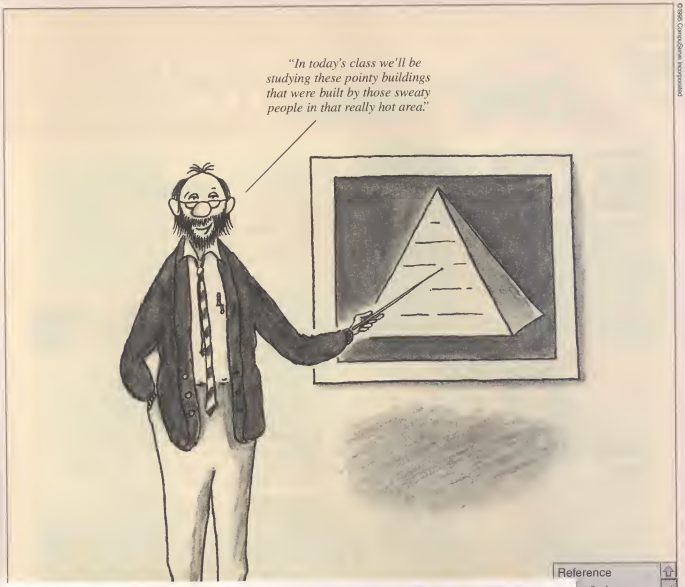

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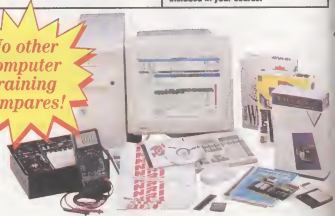

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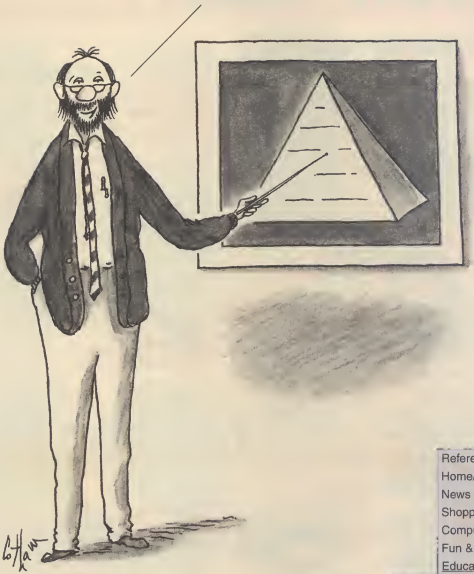

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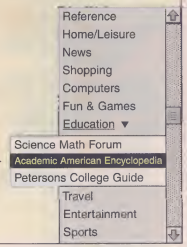

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Link MC6 smart/green/white	272.66
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1Megx4 (Zip Pk)		24 00	22 00	21 00	
256x4(Page Dip)		7 25	6 75	6 50	5 95
256 4(Static Dip)			9 95	-	
256x4(Page Zip)		9 25	9 00	8 95	
256x4(Video Zip)			12 95	11 85	9 95
256x8(SOJ)		19 00	18 00		
256 x1		3 25	2 95	2 75	2 25
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64x1				-	2 00
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T4500 C T4600 T4700 T1900 C T1910 T1950 (3 3 v)	16Meg	PC PA2014U	609 00
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T3400CT	32Meg		1549 00
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T3100SX	4Meg	PC15 PA8310U	189 00
T5200/T8500	2Meg	PC10 PA8304U	49 00
T5200/T8500	8Meg	PC10 PA8313U	369 00
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ACER 750	4Meg/8Meg/16Meg		169 319/609
ACER Note Pro ACER Note Lite	4Meg/8Meg/16Meg		189/379/677
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AST Ascentia 900N 800N	4Meg/8Meg/16Meg		169/319/809
AST Ascentia 950	8Meg/16Meg		339/638
AST Bravo & Explorer	4Meg/16Meg	501255-001 -002	169/609
AST Notebook Prem Exec 386SX/20/25/25L	4Meg	500814 003	179 00
AST Power Exec 3/25C, 425EL 425SL	4Meg/16Meg	501166 001 003	179/619
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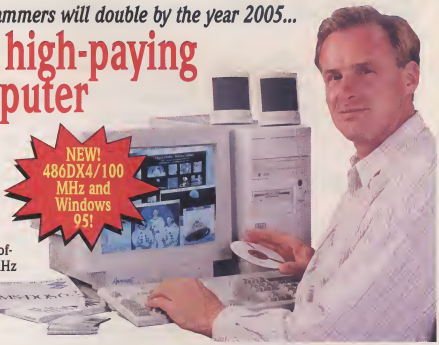

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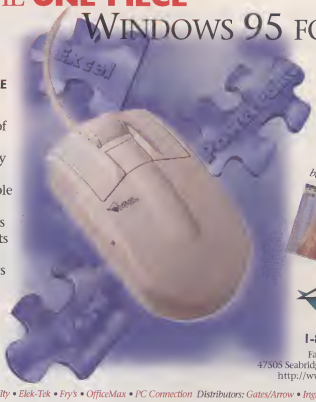

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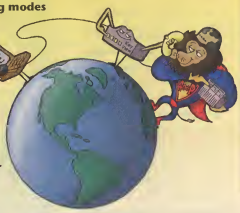

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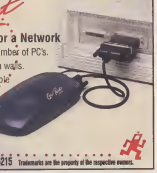

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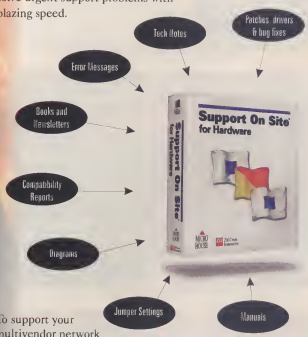

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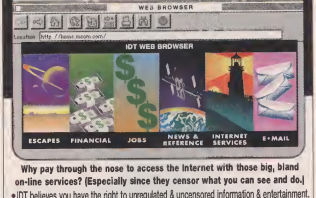

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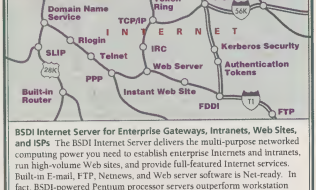

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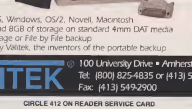

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1. **Where do you use your computer?** (Check one only):
   1. Home 2. Business 3. Both
2. **What kinds of computers do you use?** (Check all that apply):
   1. IBM/Compatible Laptop 2. IBM/Compatible Desktop 3. MAC
3. **Do you plan to buy any of the hardware or software mentioned below in the next three months?** (Check all that apply):

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1. PC
2. MAC
3. Laptop
4. Printer
5. Monitor
6. Disk/Tape Back-up
7. Add-in Board
8. Modem
9. Input Device
10. Local Area Network
11. Windows

SOFTWARE
12. Accounting
13. Spreadsheet
14. Personal Finance
15. Desktop Publishing
16. Word Processor
17. Database Manager
18. Graphics
19. Utility
20. Communications
21. Windows/Multi-tasking
22. Programming Language/ Compiler
23. Integrated/Multifunction
24. CAD
25. CD-ROM
26. On-Line Services

4. **From which of the following sources do you purchase personal computer products?** (Check all that apply):
   1. Specialty Computer Retail Stores 3. Direct from Manufacturers
   2. Mail Order Firms 4. Other

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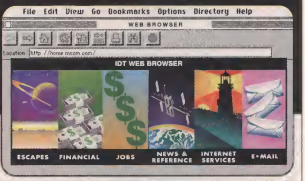

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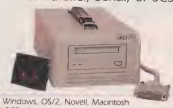

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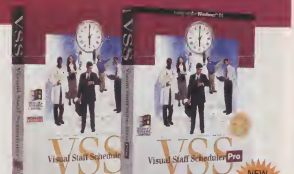

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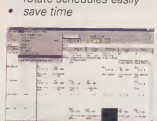

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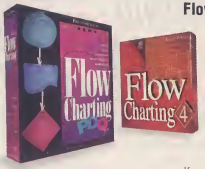

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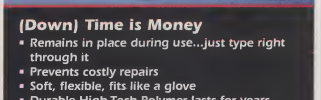

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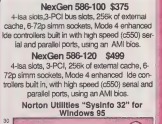

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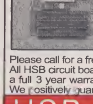

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Reader Service Numbers: Works 95, *763;* PerfectWorks 3.0, *764;* Claris Works 4.0, *765;* FotoFun, *766;* Maxmedia TV Mini, *767;* Pocket Scan Converter, *768*

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A low price doesn't mean you have to sacrifice on quality. True, you will not steal away with a 120MHz Pentium, CD-equipped unit. But you can tote a high-speed, 486 color portable with Windows 95.

We put five color portables (four of them under $2,000, except Compaq's popular Contura 430C which costs $2,499), through our usability tests. Each one

Take Me Along: The ThinkPad 365CS is a well-rounded choice.

ThinkPad 365CS / IBM / (800) 772-2227 / $1,998 est. street price / *Reader Service No. 770*

ships with Windows 95 and uses a 75MHz or 100MHz 486DX4 running on a nickel–metal hydride battery. They also boast 10.4-inch displays. That's where the similarities end.

Think ThinkPad For power, comfort, and reliability, IBM's ThinkPad 365CS gets our nod. It doesn't have the biggest hard drive, fastest processor, or lightest weight, but it's compact and easy to use.

The ThinkPad 365CS is equipped with an eraser head TrackPoint pointing device in the middle of its keyboard, which takes some getting used to. Mouse buttons are conveniently located where your thumbs rest as you type, and you don't need to remove your hands from the keyboard to move the cursor. The ThinkPad's full-size keyboard guarantees you won't get cramped hands, and the Enter and Backspace keys are located conveniently for flying fingers.

You'll find 11 tiny lights paired with icons below your screen. These are great status indicators—once you figure out what the icons stand for. To replace the battery you have to lift up the keyboard, which is easy enough to do, but you won't find any indicators on the notebook to help you.

The ThinkPad 365CS's external power supply is compact and thin, making travel with the unit relatively painless. At just under 6 pounds, the ThinkPad 365CS is great for frequent travel.

Compaq Comfort It's bigger than your standard spiral paper notebook, putting it at the larger end of the size spectrum, thus allowing Compaq's Contura 430C some design touches that make it quite comfortable. Your hands can easily spread out over the keyboard, while your palms sit on the ample palm rest.

The Contura 430C uses a familiar trackball. If you're used to a mouse, you should have no trouble adapting to it, since it's big and easy to navigate. Its buttons, though, are concave and you have to reach with your hands and thumbs a bit more than is comfortable.

The battery-indicator lights on the Contura 430C are the best we found in this batch of products. Instead of one light to let you know you're running low, it has an arc of five lights that tell you just how much juice you have left.

Replacing the battery on the Contura 430C is easy—once you find the battery compartment. At first glance, it appears you need a screwdriver to remove the compartment door. Fortunately, you just need to flick a switch on the front of the notebook. But as with

Comfy Compaq: The Contura 430C offers the most for your money.

Contura 430C / Compaq Computer Corp. / (800) 345-1518 / $2,499 est. street price / *Reader Service No. 771*

the ThinkPad 365CS, the switch isn't marked and you have to consult the documentation.

Satellite Power Considering Toshiba's Satellite T2130CS? We have just three words for you: *internal power supply.* It may not seem like a big deal, but if you're a frequent traveler, you know what a pain it is to lug around your external power supply. On the downside, the Satellite does pack some extra heft (at 6.8 pounds, it's the heaviest we tested).

With its larger size—

Travel Light: Toshiba's Satellite packs in an internal power supply.

Satellite T2130CS / Toshiba / (800) 334-3445 / $1,999 est. street price / *Reader Service No. 772*

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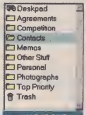

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Extensa 450 / Texas Instruments / (800) 848-3927 / $1,998 est. street price / *Reader Service No. 773*

similar in dimensions to the Contura 430C—the Satellite also has a comfortable full-size keyboard with space to rest your palms. Its pointing device is like the eraser head on the ThinkPad 365CS, but the buttons are smaller and are located on the palm rest. We'd prefer to have a more audible or tactile click when pressing the pointing-device buttons. If you plan to use an external PS/2 mouse, you have to buy an external port replicator—otherwise you have to use a serial mouse.

As with the ThinkPad 365CS and the Contura 430C, our testers had trouble finding where to install the battery without consulting the manual.

Extensive Extensa Texas Instruments' Extensa Model 450 is a spacious notebook neatly tucked into a small design. While not nearly as large as the Contura 430C, the Extensa does have a full-size keyboard and a roomy palm rest. If you like a lot of finger travel and more tactile feedback, you'll love the Extensa's keyboard.

The Extensa is the only unit we tested that ships with a touch-pad input device. Like eraser heads, touch pads take some getting used to. While you can't operate the touch pad when your fingers are on the keyboard, the buttons are located on the front of the unit where your thumbs rest. This location is comfortable, as long as you don't use the right mouse-button too often. But the reach to the right button is awkward and anything but ergonomically correct.

Do you plan to hook up the Extensa to an external monitor? No problem. It comes with an external port replicator called the Travel Bug.

Dell-Lightful If you demand a compact, sleek portable, Dell's Latitude LX 4100D is your machine—it's the smallest notebook in our roundup. The trade-off? An

Sleek and Sweet: Dell's Latitude is the smallest of the bunch.

Latitude LX 4100D / Dell / (800) 613-3355 / $1,928 est. street price / *Reader Service No. 774*

HOW IT WORKS

WHAT TO LOOK FOR IN A **NOTEBOOK**

Indicator Panels: Lights and beeps indicate the status of your notebook's functions. The power-management chip stores information about battery temperature and voltage, and controls the battery-indicator lights.

Keyboard Design: Ideal notebooks don't shrink keys too severely, reposition familiar keys, or sacrifice wrist rests. Ctrl and Alt keys should be underneath and near the Shift key. Insert, Home, and PageUp keys should stay together, too.

Ports: The best low-priced notebooks offer ports for parallel, Super VGA (monitor), serial, keyboard, and an expansion connector for a docking-station option. Avoid notebooks that require an add-on to connect a peripheral.

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Portability vs. Performance

	IBM ThinkPad 365CS	Compaq Contura 430C	Toshiba Satellite T2130CS	TI Extensa Model 450	Dell Latitude LX 4100D
Weight	5.9 pounds	6.25 pounds	6.8 pounds	5 pounds	6.2 pounds
RAM	8MB	8MB	8MB	8MB	8MB
Hard Disk	540MB	720MB	500MB	340MB	420MB

uncomfortably small keyboard that's awkward for adult-size hands. But the keyboard does have some fine points: Rather than icons marking the functions of the second-level keys, tiny words spell out options such as *password* and *setup*.

The trackball pointing device, similar to the Contura 430C's, is easy to use. And although the battery compartment isn't marked, you'll find intuitive sliding devices that let you remove components easily. After some trial and error, you're set.

Another usability gotcha: Our testers couldn't hook up an external monitor to the unit. And the manual didn't provide any extra help. It turns out you need to monkey with the function keys.

Sizing 'Em Up There are always trade-offs, especially with low-price notebooks. Test out a few systems yourself, get comfortable with the keyboard and pointing device, and decide whether light weight or full size is your priority.

For general usability, we recommend IBM's ThinkPad 365CS. If you want a fast system with a 720MB hard disk, try Compaq's Contura 430C. Texas Instruments' Extensa Model 450 offers the lightest weight for the price, but sacrifices hard disk space. As high-end features migrate down to low-end notebooks, we'd like to see labels on ports and swappable modules that let you replace a floppy drive with batteries. But for now, there are options for every user at prices that won't make you wait another year. KKC

Contributor to SOHO: KYLA K. CARLSON. *Edited by* JAMES OLIVER CURY.

DECISION MAKER WHICH PORTABLE FITS YOUR NEEDS?

Labnotes

If you run your own office, then you're the installation team, tech-support staff, and network administrator. Your notebooks have to be easy to use and maintain. *PC Computing*'s Usability Labs put five notebook systems through scripted tests to gauge their usefulness and pinpoint differences in their daily maintenance.

We had each tester inspect the keyboard size and layout, input device, indicator lights, ports, weight, and switch locations. Testers also changed some basic setup configurations to see if disabling power management, for example, was difficult. Because batteries don't last forever, we had our testers remove and reinstall batteries, as well as hook up external mice and monitors.

We evaluated each pointing device to see how easy they were to navigate the screen, click on small icons, and drag and drop selected text. Each device—trackball, touch pad, or eraser head—appealed to a different user. While we can note which usability enhancements benefit everyone, many features require that you experiment with different devices to see which one works best for you.

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WEB COMPUTERS

Internet Appliances

You wouldn't use a blender just to stir a martini, so why sink $2,500 in a desktop PC for simple Web surfing? That's the question Sun Microsystems, Oracle, IBM, and other companies are asking as the popularity of the platform-independent World Wide Web continues to surge. Their alternative? Web appliances.

According to Oracle CEO Larry Ellison, a Web appliance is a $500 device that lets the masses surf the Internet more cheaply and easily than with a relatively expensive PC. Oracle's appliance, due out sometime later this year, will have a keyboard and a microprocessor, but no drives—hard, floppy, or CD-ROM. Instead of investing and reinvesting in expensive desktop software every six months, you'd simply rent a Java applet for a few pennies a pop. Sounds rosy, right? Not so fast.

Opponents are blasting Web appliances as yesterday's dumb terminal—they say it's a dumb idea. Without disks on which to store data locally, the Web appliance makes you more dependent on the network (and data that resides on the network)—and that's where Oracle and other companies stand to reap huge rewards. You can't download applications or data if you don't have disks to save them on. You'll pay for applets the same way you pay for gas and electric utilities.

But ultimately, there may be room in the market for both PCs and Web appliances. Neither device foretells the death of the other: We'll still need powerful PCs in our offices for serious, complicated and hard disk–intensive work. But every member of the family can reap the benefits of Web appliances for Internet surfing and e-mail in the comfort of their own living rooms.

Just Turn It On: Oracle, Sony, and other companies are working on $500 Web appliances for surfing the Net.

PHOTO ILLUSTRATION BY PETER ALAN GOULD

ONE-MINUTE GUIDE — Grow Your Own Internet-Ready Bulletin Board

While the pressure to get your company on the Web increases, one product category that has surged right along with it often gets overlooked: bulletin board systems (BBSs). Many of the top BBS vendors have added direct connections to the World Wide Web. Here are a few top BBS vendors that have Internet features.

WORLDGROUP INTERNET SERVER Galacticomm's Worldgroup Internet Server is a combination of the best of e-mail, group messaging, and Internet gateway servers, mixed with Web-server and commercial online-service technology (http://www.gcomm.com).

PROJECT GENESIS Clark Development, the makers of the popular PCBoard BBS, have a new offering called Project Genesis. This BBS is inexpensive, has clients for a variety of operating systems, and supports more than 65,000 nodes (http://www.pcboard.com).

MINDWIRE Durand Communications Network's MindWire includes e-mail, forums, security, and Internet connectivity, plus powerful chat and image features (http://www.durand.com).

WILDCAT BBS 4.12 Mustang Software's comprehensive suite of BBS software includes a unique graphic-preview program, powerful sysop controls, and easy-to-use menu structures (http://www.mustang.com).

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CHECK INTO THE NETWORK Scan four cool interactive entertainment programs, including Whodunit? and CyberDates, at the Network site.
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http://www.inquiry.com

MANHATTAN BY DESKTOP Cruise the Big Apple without leaving your desk at Thirteen/WNET's NetStation.
http://www.wnet.org

EXTREME SKIING Slap on your skis and surf over to Cylogic's North American Ski Area On-line SkiData Guide.
http://www.luckydog.com/skidata

ROCKIN' GOOD TIME Rocktropolis is to the Web as trashy tabloids are to supermarkets.
http://rocktropolis.com

HELP WITH YOUR HOMEWORK Infonautics' Homework Helper provides access to the world's most advanced electronic library.
http://www.infonautics.com

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Free Stuff!

Dylan Tweney: Downloads for Productivity and Entertainment

Hot Doggin' with HTML ★★★★★

Ready for a powerful HTML editor that supports HTML 3.0 and Netscape extensions? Get HotDog Pro.
File: HDP2.EXE **Size/Time*:** 1.9MB/20 minutes

Power Tools for Power Programmers ★★★★★

Whether you're programming in HTML or Java, you'll want WinEdit, a powerful shareware text editor.
File: WE-30D.ZIP **Size/Time*:** 549K/6 minutes

Quick, Grab That Screen! ★★★★★

Snapshot/32 captures Windows 95 and Windows NT screens and saves them as BMP, JPEG, or GIF files.
File: SNAP254.ZIP **Size/Time*:** 290K/3 minutes

How Much Time Do You Spend Online? ★★★★★

If you can't answer this question, you need Rate Clock. See just how fast connect-time charges add up.
File: RATECL.ZIP **Size/Time*:** 84K/1 minute

Easy Umlauts ★★★★★

Foreigner makes it easy to insert special, non-keyboard characters from any font into any application.
File: FOREIGN.ZIP **Size/Time*:** 66K/1 minute

Impose Some Order on Your Life ★★★★

Desk getting cluttered? Try Almanac for Windows 95 and Windows NT, a PIM and calendar with unique extras.
File: ALMANT.ZIP **Size/Time*:** 470K/5 minutes

A Blackjack Table on Your PC ★★★★

Planning a trip to Las Vegas? Casino Verite Blackjack, a super-realistic Windows game, will help you get ready.
File: ECD.ZIP **Size/Time*:** 802K/8 minutes

Push-button Financial Planning ★★★★

OK, so you didn't win the lottery. But you can get Hi Finance and start making sense of your investments.
File: HIFIN.ZIP **Size/Time*:** 697K/7 minutes

Keep Track of All Those Passwords ★★★★

PassKeeper 1.01 lets you store any number of user names and passwords in an encrypted file that only you can read.
File: PASS32.ZIP **Size/Time*:** 83K/1 minute

A Better Notepad than Notepad ★★★

Notepad is great for editing simple text and HTML files. PBNotepad adds a toolbar that makes it even easier to use.
File: PBNOTE.ZIP **Size/Time*:** 92K/1 minute

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Package Deals: Make Windows More Fun

NEW BEGINNINGS

Tired of seeing all those clouds and flying windows whenever Windows 95 starts up and shuts down? Replace them with this suite of bitmap images. Includes instructions for replacing the Windows logos.

File: LOGOPAK1.ZIP
Size/Time*: 134K/2 minutes
★★★★

NOT JUST THE FAQS

For those who have been using Windows 95 for months or are just about to install it, this help file from Microsoft provides answers, technical tips, and over 100 articles from Microsoft's Knowledge Base.

File: ASSIS.ZIP
Size/Time*: 850K/9 minutes
★★★★

ROCK 'N' ROLL FONTS

There's no such thing as too many fonts! This collection contains a font modeled after the script on Enya's first album, and one inspired by Led Zeppelin. Bonus font: Prospero, a beauty for body text.

File: COOLFONT.ZIP
Size/Time*: 264K/3 minutes
★★★★★

Ratings: ★★★★★ Setting land-speed records. ★★★★ Winning the Indianapolis 500. ★★★ Driving the autobahn. ★★ Driving the New Jersey turnpike. ★ Breaking down in the boonies.

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Sam "Guru" Miller, Manager, New Product Development

To say that ViewSonic's new PT810 SonicTron™ 21" (19.5" viewable) monitor has a great picture hardly does it justice. Actually, it's better than great. Even the most particular CAD/CAM/CAE users and desktop publishers are staring in wide-eyed amazement.

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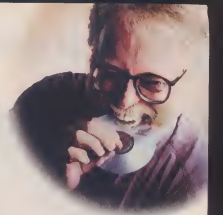

Weird Science

As anyone who slept through high-school physics knows, some things just don't make sense until you see how they work. And there's no better way to see how something works than on a multimedia CD. You can easily repeat the gobbledygook you don't understand, and a disc is a lot more entertaining than your basic science textbook.

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Nature CDs: They're not just for kids anymore. This disc captures the wonder of nature by taking you back to childhood, when you wondered all sorts of things—questions most adults couldn't answer. For your children or—well, I hate this concept, but it seems right this time—the child in you, Eyewitness Encyclopedia of Nature recaptures that inquisitive spirit. And has the answers. You get explanations of everything from how viruses reproduce to how whales feed—all supported by videos and animation, and presented with a clarity that children will understand and adults won't find patronizing. A must for any lover of nature or science.

Eyewitness Encyclopedia of Nature / DK Publishing / (800) 225-3362, (212) 213-4800 / $40 est. street price / *Reader Service No. 785*

FROGS IN SPACE ●●●

Class, you have your choice of lab work today: You can cut open a dead frog and smell like formaldehyde at lunch, or go into orbit in a space lab and learn how weightlessness affects frogs and their offspring. Frogs in Space lets you simulate the experiments conducted aboard *Space Lab J* on Space Shuttle mission STS-47 in 1992. The scientists on that mission were trying to see how weightlessness affected the fertilization and development of frog eggs. The CD has you recreate each step—even the mundane ones, like turning on a refrigerator—in a virtual space lab.

Space fans should realize that this is not *Star Wars*. It's serious business and requires an interest in science. The payoff is that the CD pays close attention to the scientific method, and you get to do something closer to original lab work than just dissecting a pickled croaker.

Frogs in Space / Computer Visualizations / (800) 771-7284, (808) 539-3669 / $50 est. street price / *Reader Service No. 786*

EVERYTHING WEATHER ●●●

Unless you're one of those people who delight in tornadoes, hurricanes, earthquakes, floods, and storms (I am), this CD will leave you cold. It's a weather freak's total immersion. There are excellent animations and explanations of what makes the weather work, but the real fun for the disaster devotee comes from viewing the videos of whirling funnels cutting through farmland and cities. There's also a daily planner that's pretty useless as an information manager, but contains a weather fact for the day. And if you don't get the Weather Channel, which helped put this disc together, you can dial up a service to get an up-to-the minute weather forecast for 75 cents on your phone bill.

Everything Weather / Bureau of Electronic Publishing / (800) 828-4766, (201) 808-2700 / $50 est. street price / *Reader Service No. 787*

THE INTERACTIVE PERIODIC TABLE ●●●

One of the great mysteries that has haunted humankind ever since high school is the periodic table of elements. We've all seen the chart hanging in the chemistry lab with a bunch of two-letter abbreviations arranged in a mystifying collection of blocks. Any CD that helps shed light on this enigma has to be worth something. The Interactive Periodic Table lets you click on any element in the chart to get more information on it—from the history of its discovery to its boiling point and electrical resistivity. The best part is the animations of the atomic structure that rotate, so you can see molecules from all sides. There's also an extensive graphing function that is even more obscure than the periodic table itself. Perhaps some of life's mysteries are destined to remain so.

The Interactive Periodic Table / Cambrix/Airteq / (800) 992-8781, (818) 992-8484 / $30 est. street price / *Reader Service No. 788*

BOB WINKLE SOLVES LIFE'S GREATEST MYSTERIES ●●●●

What's it worth to find out what causes a headache? A dollar? How about a buck to learn how optical illusions work, or 100

●●●●● *Discovery of space-time continuum.* ●●●● *Discovery of steam engine.*
●●● *Discovery of DNA.* ●● *Discovery of lost sock.* ● *Discovery of Ronco Chop-o-Matic.*

PHOTOGRAPH BY JAMES McGOUGH

CD-RONWhite

One Last Question: Bob Winkle explains 40 things, why not more?

pennies to improve your memory? That's the price of knowledge in Bob Winkle Solves Life's Greatest Mysteries, a CD from the folks who gave us A.D.A.M., the incredible vivisected man.

In the new CD, a fictitious character named Bob Winkle gives explanations—complete with art and animations—for 40 of the most-asked questions of science and medicine. How do you catch a cold? What causes Siamese twins? What is cancer? What do my dreams mean? At a street price of $40, you wind up paying a dollar per question. The answers are clear, easy to understand, and entertaining without sacrificing the depth that these great questions of life deserve. My only complaint is that even a three-year-old can think of more than 40 questions about the ultimate mysteriousness of life. Give us a few more answers for our 40 bucks.

Bob Winkle Solves Life's Greatest Mysteries / A.D.A.M. Software / (800) 408-2326, (818) 549-0222 / $40 est. street price / *Reader Service No. 789*

TAKE FIVE ○○○

If New Age music, crystals, and horoscopes sound good to you, you'll be at peace with Take Five. This Windows/Macintosh CD plays soothing music that continues even after you switch back to that stressful spreadsheet you're working on. If your spreadsheet's not that demanding, linger in Take Five to play with Music of the Spheres, in which you lazily bounce balls of stone to hear the soothing sounds each one makes—from a Mozart string quartet to the rumbling of a rain forest. Use Visual Vacation to view a musically backed slide show of where you'd rather be. Or pick from 19 meditations that use "guided imagery to enhance creativity." (Hey, I'm just reporting this.) To get physical as well as spiritual, 45 QuickTime movies are the keys to restoring "energy and flexibility" to any part of the body you choose.

Take Five: Relax Your Body & Refresh Your Mind / Voyager / (800) 446-2001, (212) 431-5199 / $29 est. street price / *Reader Service No. 790*

CARTOON HISTORY OF THE UNIVERSE ○○○○

Larry Gonick's book is the basis for this two-disc set, and it is one of the great rebels of scholarship. By using time-honored comic-book techniques—simple drawings and broad jokes—the idiosyncratic comic strip creates stand-up history that's almost impossible not to learn, as well as enjoy. And it's not all history; the first of the seven volumes is really about physics, a breezy account of the Big Bang.

Timely Jokes: Cartoon History of the Universe turns history into laughs.

There's also a strange volume on the Old Testament that has a different slant on Biblical events. For example, I never realized that God punished the Philistines for stealing the Ark of the Covenant by giving them hemorrhoids. This Windows/Macintosh CD also has some games dressed in historical togs, but the best side trip is a drag-and-drop reconstruction of the Acropolis using its scattered ruins. Too bad the history ends at only about 400 B.C.

Cartoon History of the Universe / Putnam Publishing / (800) 788-6262 / $40 est. street price / *Reader Service No. 791*

ANNE HOOPER'S ULTIMATE SEX GUIDE ○○○○○

Yeah, yeah. You think you know all there is to know about sex. Well, then, can you describe the Horse of Hector? How about

Sex, Not X: The Ultimate Sex Guide's contents are always tasteful.

the exact location of the E spot? (Or is that the G spot?) So, you're not the sex animal you thought you were. For a refresher course—or for youngsters who need a better way to get the facts of life than from some 12-year-old behind a shed—Anne Hooper's Ultimate Sex Guide is the best thing on CD (even better than Dr. Ruth's own sex CD-ROM).

The content isn't anything the kids couldn't see on HBO. You get text, videos with attractive and naked people, and illustrations or animations for anything that involves genitals or anything that would be considered X-rated. This is more than just a mechanical, how-to instruction guide. It pushes sex as a healthy activity, and spends a lot of time on the emotional side of sex, hygiene, sexual diseases, and "sophisticated" sex techniques. The more you think this CD isn't for you, the more you probably need to give it a spin.

Anne Hooper's Ultimate Sex Guide / DK Publishing / (800) 225-3362, (212) 213-4800 / $40 est. street price / *Reader Service No. 792*

BUMPTZ SCIENCE CARNIVAL ○○○○

This is Mr. Wizard meets Rube Goldberg. The Bumptz creatures introduce children to science with animations of 20 hands-on experiments that teach the properties of such things as light, magnetism, and buoyancy. Plus, it has more than 200 puzzles and a puzzle-construction kit—all within a genuine carnival atmosphere. Your kids will have so much fun with this Windows CD, they may not notice they're learning something.

Bumptz Science Carnival / Theatrix Interactive / (800) 955-8749, (510) 658-2800 / $35 est. street price / *Reader Service No. 793*

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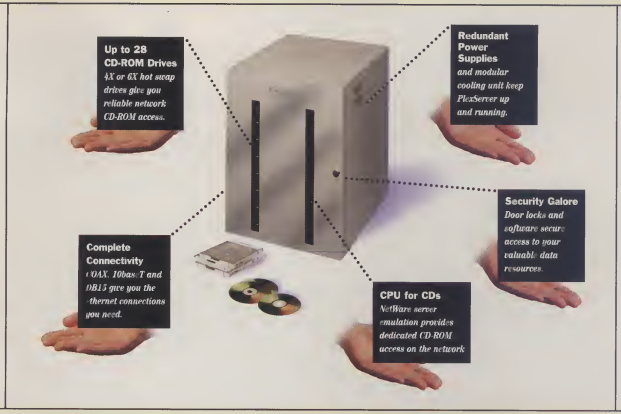

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HotList

BY JACK LYON

Bookmarks of the Rich and Famous

Charmed, I'm sure. This month, our highbrow aristocrats climbed the palace walls, fought off the beefeaters, and crashed teatime, just to get a glimpse of the royal bookmark list of Princess Di. See what scandals lie beyond Buckingham Palace, here and online (www.pccomputing.com).

All the King's Horses
The British Horse Society
http://www.w3w.com/bhs.html

And All the King's Men
Red Coats
http://hastings.ci.lexington.ma.us/WebPages/Colonial/RedCoats/RedCoats.html

Couldn't Put Charles and Di Together Again
I Was Unfaithful, Confesses Diana
http://www.pa.press.net/princess/lead3.html

Fractured Fairy Tales
Diana: The BBC Interview in Full
http://www.atcon.com/~soccer/diana/

Three's a Crowd
Charles's Other Woman
http://www.pa.press.net/princess/lead5.html

Will Trade for Cash?
The Princess Jewelers
http://www.princejewels.com

Future Earnings
Trends in Alimony and Child Support
http://www.interbit.com/ksc/alimony.htm

More Future Earnings
Talk Shows
http://www.yahoo.com/Entertainment/Television/Shows/Talk_Shows/

Elephants Have an Excuse
Why Do Elephants Have Big Ears?
http://www.zoobooks.com/long.html

Prince of Whales
The Cousteau Society
http://www.math.clemson.edu/~rsimms/cousteau.html

Prince of Wails
Artist-Formerly-Known-as-Prince Swap List
http://www.mtsu.edu/~spth0001/

God Help the Queen
My Mother-in-Law
http://www.muw.edu/~bfugitt/personal/wod/index.html

Ruling Solo
Single Mothers by Choice
http://www.parentsplace.com/readroom/smc/index.html

Favorite Band
Princess Princess Fan Page
http://www.inforamp.net/~rtang/jpop/pripri/p2home.html

Favorite Movie
The Princess Bride
http://athena.athenet.net/~denij/PBindex.html

Battling with Biscuits
Eating Disorders
http://www.naples.net/social/jfh0001.htm

The Daily Diet
The Princess and the Pea
http://www.northsouth.com/Backlist/80344.html

You Like Me, You Really Like Me?
Royal Family Opinion Survey
http://galileo.metatech.com/surveys/royal/royald.htm

Always a Princess, Never A Queen
Odds That Charles Will Renounce Right to Throne
http://www.pa.press.net/princess/lead20.html

Vacation Options
Princess Cruises
http://www.bolack.com/princess.htm
Royal Caribbean Cruise Line
http://www.webcom.com/odyssey1/travel/rccl.html

Once Again a Lady
The Divorce Page
http://www.primenet.com/~dean/

It's a Family Affair
The Royal Family at Buckingham Palace
http://www2.pitt.edu/~figtree/britain4.html

Read Between the Lines
Princess Di ASCII Art
gopher://twinbrook.cis.uab.edu/OA/P/LadyDi.pas

My Adoring Public
Diana, Her Royal Beautiness
http://www.aquanet.co.il/diana1.html

Theme Song
"Dirty Diana," by Michael Jackson
http://www.en.com/users/brown-mb/smb/dirty.htm

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